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40	30.93	38.20	24.42	16.45
45	37.52	44.31	29.11	21.41
50	46.37	53.14	36.44	30.31

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VOL. XIII JUNE, 1930 No. 6

ESSENTIAL HYPERTENSION — PARTICULARLY STRESSING THE SIGNIFICANCE OF DIASTOLIC BLOOD PRESSURE*

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Saint Paul

ESSENTIAL hypertension has attracted a great deal of attention during the past decade, and is now generally recognized as a definite clinical entity, being more clearly differentiated from other diseases in which abnormally high blood pressure is a symptom. It was not until 1906 that blood pressure instruments were perfected and simplified so that they might be utilized by the average physician. Life insurance companies early recognized the value of taking the blood pressure, and set about to instruct their examiners as to proper technic and also endeavored to popularize the procedure as a routine measure to be used not only in insurance examinations but clinically as well. It was not, however, until 1918 that the companies realized that the diastolic pressure was as important as the systolic; this being stimulated by the adoption of the auscultatory method which about that time replaced the palpatory method.

In the consideration of the subject of hypertension, we have first to remember that the blood pressure is extremely variable in many individuals. It may vary from month to month, from week to week, and even from hour to hour in some individuals. As a general rule, however, the diastolic will be found to be much more constant than the systolic, and I believe of much more prognostic importance.

Since the technic for taking the systolic measurements was described at a much earlier date than the diastolic, it has, until of late, been the habit with the profession to be complacently satisfied with the taking of the systolic alone. This is unfortunate, and to those who believe the diastolic to be of greater significance, it is rather disappointing to observe how often no mention whatever is made of the diastolic pressure either by research workers or clinicians. An immense amount of study has been done regarding hypertension in large groups of individuals, both in institutions and in clinics. These individuals were studied over long periods of time and with great expenditure of effort, and yet so simple a procedure as to include in these studies the taking of diastolic pressures has been lamentably disregarded. This is unfortunate because in our opinion the information secured from the taking of both systolic and diastolic pressures is of incomparably more value than that which can be obtained by gauging the systolic pressure alone.

Reisman and Weiss in the current number of "American Heart Journal" dismiss the subject of diastolic blood pressure with one short paragraph. "A patient may be considered to be suffering from hypertension who has a diastolic pressure in the neighborhood of 100 mm. hg., though the systolic is only moderately elevated."

We believe that, as we learn more about the dynamics of the circulation, the diastolic pressure will come to be, for prognostic and clinical purposes, paramount in importance. Weiss states:

"Of all the information obtained in blood pressure estimation, the diastolic pressure is the most constant. It is less influenced by such factors as rest, exercise, diet, time of day, etc. When it does vary, the fluctuation is not so great, it gives more reliable information than the systolic or the pulse pressure."

It is unquestionably true that the reason the diastolic pressure was so long ignored is that the technic for taking the systolic measurements

*President's Address read before the Minnesota Academy of Medicine, January 8, 1930.

was described at a much earlier date than that for taking the diastolic and that it has been difficult to obtain proper readings. This has been very evident to insurance companies, whose experience shows that there is no uniformity in technic, some examiners recording their observations at the fourth phase (at the change of sound) and some at the fifth phase (or the disappearance of all sound).

It has been shown that most medical schools teach their students to observe the diastolic pressure at the fourth phase (at the change of sound), but owing to the fact that many physicians have no "tone sense" and that others for various reasons are unable to accurately detect the *change* of sound, it has become an almost universal practice for insurance companies to instruct their examiners to record the diastolic pressure at the disappearance of all sound (fifth phase), for the reason that it is best understood and certainly more generally used.

It is true that whether one or the other phase is used, there is a difference of only about 4 mm. hg. in the average case, but, owing to the attempted exactitude of insurance companies for statistical and practical considerations, this 4 mm. hg. may mean the difference between the rejection or the acceptance of risks which are borderline as to their blood pressure.

Our knowledge of and confidence in the ability of our examiners are very important factors in estimating the value of the readings given. It occasionally happens that very extraordinary pressures are reported such as systolic 130, diastolic 120. This disturbs our confidence in the ability and progressiveness of an examiner much more than it does the question of the insurability of the applicant. Fortunately, the number of physicians recording such impossible readings is rapidly decreasing. I trust I may be pardoned at this time for reviewing the technic concerning the various phases of blood pressure estimations:

First Phase—Is of short duration, often difficult to detect. Sounds are soft and dull.

Second Phase—Extends over a range of from 20 to 60 mm. hg. The quality of the sounds is variable, and it is here the silent gap occurs when present.

Third Phase—Most distinctive phase. Here the sounds are loud and snappy, increasing in intensity to a maximum when they suddenly change to fourth phase.

Fourth Phase—Of short duration; sounds soft and dull.

Fifth Phase—Sounds disappear altogether.

AVERAGE DIASTOLIC PRESSURE

20,735 Cases

Fourth and Fifth Phases

		October 1922 4th Phase	*October 1923 5th Phase*
Age	20	78	73
	25	79	74
	30	80	75
	35	81	76
	40	81	76
	45	82	77
	50	83	78
	55	84	79
	60	85	80

Warfield states "that until recently there was no unanimity of opinion concerning the point where the diastolic pressure should be read." Korotkov himself thought it should be the fourth phase. Fischer, Lang and Manswatona agreed. Ettinger maintained that the end of the fourth phase, or at the disappearance of all sound, was the place to take the diastolic reading. American investigators followed his lead.

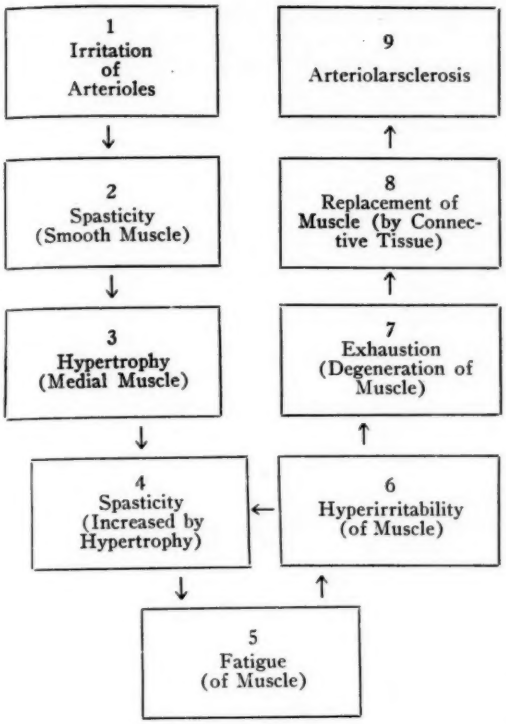
AVERAGE BLOOD PRESSURE

Graduated results for quinquennial ages in group 545,121 cases, showing average systolic and diastolic (fifth phase) pulse pressures.

Age	*Systolic*	*Diastolic*	*Pulse Pressure*
20	120	79	41
25	121	80	41
30	123	81	42
35	124	82	42
40	125	83	42
45	127	84	43
50	129	85	44
55	131	86	45
60	134	87	47

PATHOGENESIS

I have recently been privileged to have presented to me a graphic outline of what I regard as a most lucid illustration of the changes which probably occur in the circulatory system where hypertension exists. The following data were furnished me by Dr. E. J. Stieglitz, who has done a great amount of research work in connection with hypertension, and I feel greatly indebted to him for permitting me to present his theories concerning this phenomena at this time:



The vicious circle of fatigue or the perpetuating factor is represented by steps 4—5—6—4.

BLOOD PRESSURE

The diastolic tension represents the peripheral resistance to the circulation and therefore indirectly is an expression of the tonus of the arterioles. Hypertension is an *arteriolar* disease. The systolic tension represents the diastolic resistance *plus* the force of the left ventricle to overcome this resistance. Therefore, in the absence of thyrotoxicosis or aortic valvular disease a liberal pulse pressure is desirable.

The diagram represents a crude attempt at visualizing the "pathogenesis of the arteriolar changes in hypertension."

Step 1

There occurs *irritation* of the arterioles by almost anything (toxins, protein excess, bacterial poisons, condiments, vasomotor hypertonia, etc.), which results, of course, in

Step 2

Increased tonus or *spasticity* of the smooth muscle of mesial layer of the arterioles.

Step 3

If such increased tonus continues any length of time hypertrophy of the muscle is inevitable, as *hypertrophy follows increased work* anywhere.

Step 4

Because of such hypertrophy, with a continuation of the original irritation, the *spasticity* becomes even more marked.

Step 5

But muscles are *not* adapted to continuous strain, as is well known, and such continuous hypertonia or spasticity leads to *fatigue*.

Step 6

Fatigue (to be sharply differentiated from exhaustion) makes muscle cells more irritable, and *hyperirritability* results.

Such hyperirritability is also seen in the nervous mechanism. We all become cranky, fussy, irritable when very tired. With such a lowered threshold mild irritation or stimulation leads to an exaggerated response of more spasticity.

Thus a *vicious circle* is set up: Steps 4—5—6—4. This is called "The perpetuating factor in hypertension," as it continues to operate, although the original sources of irritation in Step 1 have ceased to exist. It may also be termed "the vicious circle of fatigue."

Step 7

If fatigue continues to *exhaustion*, the muscle cells degenerate, die and fail. Thus simultaneously with the activity of the vicious circle, some cells are slowly exhausted.

Step 8

As these fall by the wayside, replacement with connective tissue takes place; fibrosis occurs.

This is *not* an invasive process or an aggressive cirrhosis; the connective tissue proliferates to support the crumbling framework of the vascular wall as a scaffolding to protect it. Eventually the greater portion of the arteriolar medial muscle is replaced and the final stage is

Step 9

Arteriolarsclerosis.

Up to Step 7 the processes are reversible biologically; fatigue may be relieved by rest, hypertrophy may subside. Beyond Step 7, with fibrotic replacement of *exhausted* muscle, the processes are irreversible and *not* amenable to therapy. Characteristic, of course, of the spastic earlier phases is the variability of the diastolic tension; inversely, after fibrosis occurs, diastolic tension is fixed and rigid. Therefore, we may use the variability of the diastolic tension as an index to the degree of permanent change; the more variable the diastolic tension is, the *less* the actual sclerosis.

Of course, all of these processes are slow and gradual; taking years to develop. Probably in various structures various phases of this procession occur simultaneously, and there is *no* sharp transition between the steps.

ETIOLOGY

The mere fact that the disease has been named essential hypertension is evidence that the cause is unknown. The literature is pregnant with theories as to the cause, but I shall refrain from reviewing this literature so freely referred to in several recent papers on this subject, and state in a general way that the most likely factors in producing this condition are: (1) heredity; (2)

discordant social or business life; (3) strain—mental and emotional; (4) infections and toxic conditions.

It is a fact, as Fahr points out, "that many physicians today still believe that arteriosclerosis is commonly the cause of high blood pressure. Many cases of known high blood pressure show very little or no arteriosclerosis of the palpable vessels nor does arteriosclerosis in itself increase the work of the heart. The term "arteriosclerotic heart" should be reserved for cases with coronary arteriosclerosis." A series of experiments by F. M. Smith and his co-workers led them to conclude that the rate of coronary flow is greatly altered by changes in the diastolic pressure even in the presence of changes in the systolic pressure in the *opposite direction* (i.e., low systolic pressure). They conclude that the maintenance of the essential coronary circulation is fundamentally dependent upon the height of the diastolic pressure and that while the systolic phase of blood pressure may to a certain extent influence the coronary flow, it is certainly subordinate to that of the diastolic pressure in maintaining the coronary circulation. Rountree believes "there is an unknown factor in the etiology which is not understood as yet." He is inclined to the view that "in the beginning at least the arteries are not so much at fault as they are sinned against, chiefly through the vasomotor centers and sympathetic system. Vasoconstriction in hypertension (the physiologic conception of vascular spasm) is replacing, in part, the older idea of anatomic narrowing or fibrosis; both are important, but the vasoconstrictor factor has not received the consideration it merits."

Pines, in a very classical article in the March, 1929, British Journal of Ophthalmology, believes that:

"The systolic blood pressure, although an invaluable part of the clinical picture, can be appreciated correctly only in conjunction with other clinical data. Diastolic pressure bears quite a different significance. It shows the continued pressure and, therefore, the permanent damage to the arterial wall. A continuously raised or, even worse, rising diastolic pressure means a serious prognosis. It does not fluctuate as widely as the systolic pressure; one can rely more upon it. Two men having a diastolic pressure of 130 are both under the sword of Damocles, although they may seem quite well and clinical investigation does not show signs of damage to the kidney. The retina, of course, will show in most cases the true state of affairs."

Kernohan and Keith state that "considerable controversy has existed as to whether any characteristic pathologic lesion is present in the smaller arteries. Interest in the subject was aroused by the ophthamologists being able to demonstrate so frequently a narrowing of the retinal arteries in cases of so-called malignant hypertension."

Recently these same authors have classified essential hypertension clinically into practically three groups:

1. Mild benign shows diastolic under 115 mm. hg.; no impairment of heart or kidney.

2. Severe benign, diastolic *over* 115 with evidences of impairment of vital organs and often with changes in the retina.

3. Malignant hypertension—the diastolic over 130 to 150 or higher, perhaps with marked impairment of vital organs with special changes in the retina and changes in the retinal vessels.

Insurance companies would class all three as decidedly malignant, though many of our examiners do not hesitate to freely recommend risks as first class who qualify as "mild and severe hypertension" candidates.

There is abundant evidence to show that there is at present a definite increase in the morbidity and mortality due to hypertension and its sequelæ, namely: (1) cardiac lesions; (2) apoplexy; (3) coronary diseases. The mortality statistics of life insurance companies show ample evidence of this.

From the mass of data relative to the influence of high blood pressure, there is convincing evidence that excess mortality is a function of degree of departure from normal findings. Clinical evidences, however, are convincing that a certain degree of advanced blood pressure can not in all cases have the same significance with respect to life duration, for the reason that temporary rises in blood pressure occur as a result of various *temporary* factors such as excitement, fatigue and as seen in cases of so-called "high-strung" individuals. We believe, however, that the higher *diastolic* pressure is less influenced by these factors, and when found is very significant. As a general rule when the diastolic pressure is found to have a constant reading of 100 mm. hg., we believe hypertension is present, whether

the systolic is 170 or 140, and a request is then made for further readings, and specimens of urine are submitted and examined at the Home Office laboratory.

O'Hare believes that a persistent diastolic of over 90 at ages under 40, or of 95 at ages over 40 will show a high mortality, and that a diastolic pressure of 100 or more at any age is to be considered pathologic. The persistence of raised diastolic pressure places the patient in danger of three serious sequelæ: (1) heart muscle failure; (2) cerebral hemorrhage; (3) chronic nephritis.

INSURANCE MEDICINE

In 1923 the joint committee on mortality of the Actuarial Society of America and the Association of Life Insurance Medical Directors began to investigate the effects of blood pressure on mortality; this study was completed and published in 1925. As it was not until 1918 that the companies generally required both systolic and diastolic blood pressure readings under printed instructions which were followed by examiners throughout the United States and Canada, no study was made of the subject prior to that year. During the period from 1906 to the present time, there has been a gradual education of physicians and an improvement in the technic of taking blood pressure readings. At first the systolic was taken by the palpatory method. Later it was realized that the auscultatory method was more reliable. It is, therefore, necessary to remember that the conditions under which the readings were taken differed in the various companies and that full information was necessary in order to arrange the data into homogeneous groups. The companies determined for themselves the reliability of the readings. Some took material from cases examined in the large cities by selected physicians. Others from cases examined at the Home Office and in cities where they had medical referees. Still other companies listed examiners who were known to be careful and capable of taking blood pressures accurately, irrespective of whether located in the cities or in the country. These data were contributed by twenty-five of the largest American and five of the largest Canadian companies. From these 707,000 cards (see table) were obtained. It may be said, in passing, that the insurance in force in these companies represented three-fourths of the total insurance carried in the United States and Canada. The last year of issue to be taken was 1920; observation carried to 1924. The objects of the investigation were to determine:

1. The average systolic, diastolic and pulse pressure according to weight and height of men and women.

2. The mortality according to departure from the: (a) average systolic pressure; (b) average diastolic pressure; (c) average pulse pressure.

DISTRIBUTION OF THE CARDS

		707,000 Lives		
(a)	Men—Standard lives	647,000		
	Women " "	53,000		
	Men—Substandard lives	6,500		
	Women " "	500		707,000
(b)	Systolic—Auscultatory	697,000		
	Palpatory	10,000	(all by one company)	707,000
(c)	Diastolic—Fifth phase	500,000		
	Diastolic—Fourth phase	207,000		707,000

It was to be hoped in a study of this kind from life insurance statistics that some reliable data concerning the significance of diastolic blood pressure could be presented, which would be of general interest to the medical profession. We are not at all satisfied with the results of such investigations made thus far, as, owing to the comparatively recent application of the procedure for taking diastolic pressures and the apparent neglect or indifference on the part of the profession to properly evaluate the procedure, not enough time has been allowed to elapse to draw very definite conclusions. Suffice it to state that enough material is at hand to warn medical directors, at least, to fear any case whose diastolic blood pressure hovers around 100 mm. hg. or more, for such cases will undoubtedly show a higher mortality than average.

The Committee says, "While certain conclusions have been developed they do not feel that they should specify the extent to which these are applicable to the selection of individual risks. These conclusions may be briefly stated as follows:

1. The mortality is lower than the average when the systolic or diastolic taken by itself is somewhat below the average, but no information is yet available regarding the effect of *very low* blood pressure. The average blood pressure does not, therefore, appear to be the point of lowest mortality.

2. The good effect of a systolic or diastolic

pressure slightly below the average is likely to be greater at the younger than at the older ages.

3. The mortality increases rapidly with the increase in blood pressure over the average.

4. Substantial departures from the average blood pressure are less significant in the case of pulse pressure than in the case of either systolic or diastolic pressure.

INCREASED MORTALITY OF CASES WITH ELEVATED DIASTOLIC PRESSURE

2,634 Cases

Ratio of Actual to Expected

Group A plus 10 to 16 increase in mm. Hg.....135%
Group B plus 17 to 23 increase in mm. Hg.....188%
Group C plus 24 to 30 increase in mm. Hg.....214%

	Actual Deaths	*Expected*	*Ratio*
Group A	52	38.6	135%
Group B	41	21.8	188%
Group C	24	11.2	214%

Rearranging this Material according to ages at entry:

Age	*Actual Deaths*	*Ratio of Actual to Expected*
15-39	13	115%
40-49	53	221%
50-65	51	140%

A high diastolic pressure is apparently of more importance at the middle ages of life (40-50) than at the younger or older ages.

EQUITABLE EXPERIENCE

9,280 Lives

Issues 1916 to 1924 Inclusive

Group	*Diastolic in Excess of Average for Age*
X	10 to 16 mm.
Y	17 to 23 mm.
Z	24 to 35 mm.

Ratio of Actual to Expected Deaths

Group	*To Age 39*	*Ages 40-49*	*Ages 50 and Over*	*All Ages*
X	89%	100%	89%	93%
Y	77%	199%	97%	112%
Z	52%	177%	145%	130%

CAUSES OF DEATH

Until quite recently it was generally believed that the chief cause of death as a result of hypertension was apoplexy. (Romberg states cerebral hemorrhage or thrombosis causes 45 per cent deaths in hypertension.) Fahr has recently reported that there are 140,000 persons in the United States who die each year from the consequences of high blood pressure, approximately 50 per cent due to cardiac failure consequent upon high blood pressure.

CAUSES OF DEATH

Essential Hypertension

	Heart Disease	*Apoplexy*	*Uremia*	*Miscellaneous (Intercurrent Disease)*
Bell (Myocardial insufficiency including cornary sclerosis)	60%	19.3%	8.5%	11.7%
Christian	32%	25 %	4.5%	37.5%
Granger	52%	31 %	5.5%	11 %

Mortality Investigation of Group 707,000

	9,938 Deaths	*Ratio*
Organic Heart Disease	29%	24
Apoplexy	18%	15
Bright's Disease	14%	12

According to Dr. E. T. Bell, only 10 per cent of hypertension hearts have no demonstrable coronary sclerosis. About 55 per cent show a very moderate degree of arteriosclerosis of the coronaries; 35 per cent of all hypertension hearts have moderately severe to severe arteriosclerosis of the coronary vessels. In these cases there is often very definite degeneration of part of the heart muscle with fibrosis and in these hearts the obstruction to normal volume of blood flow through the heart muscle is a serious handicap to the efficient working of the overworked heart muscle. Should a patient with high blood pressure escape apoplexy or uremia or an intercurrent death from other cause he will surely develop heart failure ultimately.

Prognosis is very difficult to estimate. Some progress rapidly to fatal ending and some live even beyond their normal expectancy of life and then die of some intercurrent disease. The essential factor is the ability of the myocardium and cerebral vessels to withstand the strain of the continued pressure.

The high diastolic pressure is of serious import, as neither the vessels nor the heart seem able to withstand a diastolic pressure of 120 mm. hg. for any great length of time.

SUMMARY AND CONCLUSIONS

1. The importance of diastolic blood pressure is seemingly not sufficiently emphasized or its significance appreciated by the profession at large.

2. Arteriolosclerosis is not an invasive process, or an aggressive sclerosis, but a replacement of muscle tissue by connective tissue—a fibrosis.

3. We would be inclined to believe that every case showing a constant diastolic blood pressure of 115 mm. hg. or over, is potentially, at least, a case of malignant hypertension.

4. Many cases of so-called "heart deaths" can be attributed to arteriolarsclerosis and are responsible to a large degree for the high mortality in the fourth and fifth decades of life. Insurance statistics show a decided rise in mortality at the ages of 40 to 50 from "heart deaths."

5. Persistent diastolic blood pressure of over 90 mm. hg., at ages under 40, or 95 mm. hg. at ages over 45, will show a higher mortality than normal.

ULCERATIVE COLITIS AS A COMPLICATION OF ABDOMINAL OPERATIONS*

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and
FRED W. RANKIN, M.D.,
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A DEFINITE or even a likely explanation of the cause of postoperative diarrhea rarely can be given. There are times when the condition becomes intractable. Diligent search of the numerous watery, sometimes lienteric stools, fails to reveal organisms of dysentery, typhoid fever, paratyphoid fever, or of any of the Gram-negative bacteria associated with intestinal disease. Likewise, search for parasites of all kinds proves fruitless. Usually there has been normal postoperative convalescence for the first four to six days, or even for a week, with the usual postoperative rise in temperature with subsequent return to normal and, then without demonstrable other break in the postoperative course, the patient has complained of abdominal cramps and has begun to pass loose stools. At first three to four stools have been passed in twenty-four hours, then gradually the number has increased to many rectal discharges in twenty-four hours, usually watery and mixed with pus. When this stage has been reached, occult blood soon appears, but gross blood in noteworthy quantities rarely is recognized. Occasionally the stools are streaked with blood. The patient gradually fails, he has great difficulty in retaining food or drink, and consequently the intake of calories by mouth is substantially reduced. Moreover, he becomes steadily depleted by the frequent rectal emissions. There may be a subsequent rise in temperature, but there is just as likely to be an afebrile course, or the temperature may even sink to subnormal levels. Failure is progressive, and finally death occurs. At no time since the onset of the diarrhea has there been a suitable opportunity for proctoscopic investigation, nor has the patient's condition been favorable for such a maneuver.

*Submitted for publication March 26, 1930.

The observation of several such cases prompted us to inquire into the frequency of this complication, and twelve cases were found in the necropsy records of The Mayo Clinic in the years 1922 to 1929, inclusive, or an average of a case and a half a year, in a total of approximately 65,683 major abdominal operations (tabulation). Four reports of illustrative cases follow:

Case 1 (Case 2 in the tabulation).—A woman, aged fifty-two years, the wife of a farmer, came to the clinic October 25, 1923, complaining of gastric trouble of thirty-two years' duration. She never had felt well in these thirty-two years, but with her attacks of indigestion her condition was worse. At such times, she had gas, belching, sour stomach, nausea, and a dull, aching pain in the epigastrium an hour after eating. Occasionally there was emesis, but never of blood. The condition gradually had become worse. She had taken many kinds of medicine, with temporary relief. Taking of soda used to relieve her. In the few months preceding her admission to the clinic, she had had three very severe attacks. She had lived on a bland diet for some time.

On admission, the patient's weight, which had been 130 pounds five years before, was 100 pounds. The blood pressure in millimeters of mercury was 94 systolic and 60 diastolic. The numbers of leukocytes and erythrocytes were within normal limits. Roentgenograms of the stomach gave evidence of a gastric ulcer. Examination otherwise gave essentially negative results.

November 5, 1923, knife excision of the ulcer, and posterior gastro-enterostomy was done. About the seventh day after operation intermittent vomiting began. The vomiting was worse after the thirteenth day. It was found that very little was passing through the stomach. The urinary output fell, and the blood urea rose to 126 mg. in each 100 c.c. On the seventeenth postoperative day, jejunostomy was performed. Everything seemed in good condition about the opening made at gastro-enterostomy. There was some angulation of the duodenum, which was adherent to the anterior abdominal wall; this was released. Failure was progressive and the patient died on the fifth day after the jejunostomy.

At necropsy ulcerative colitis, with perforations in the

sigmoid portion of the colon, terminal local peritonitis, and an old, healed duodenal ulcer were found.

Case 2 (Case 3 in the tabulation).—A man, aged fifty-nine years, a farmer, came to the clinic August 19, 1929, with a history of epigastric distress for ten or twelve years. This distress consisted of a feeling of fullness which came between one and two hours after meals, and lasted about an hour. Application of heat would relieve him; taking of food would not. There was some pyrosis. The attacks would be worse in the fall of the year. There had been no visible blood in the stools. The bowels had moved normally.

The patient appeared sallow, and had lost 20 pounds in weight. There was some sense of resistance in the epigastrium. Otherwise examination gave negative results. The numbers of erythrocytes and of leukocytes were within normal limits. Roentgenograms of the stomach gave evidence of an ulcer on the lesser curvature, fairly high in the stomach.

August 24, partial gastrectomy of the posterior Polya type was done, and a perforating ulcer of the stomach was found. For the first three days after operation the patient's condition was good; his maximal temperature was 100.8° F. On the fourth day he had eight stools in twenty-four hours; on the fifth day, eighteen stools, and from then on persisted intractable, continuous diarrhea. The patient had no desire to eat, and refused food. Solution of glucose was given intravenously, and finally nasal feeding was resorted to. He died September 21, from subacute ulcerative colitis, involving the entire colon.

Case 3 (Case 5 in the tabulation).—A man, aged sixty-three years, a farmer, came to the clinic in December, 1928, with a history of attacks of distress in the upper part of the abdomen of eight years' duration, characterized as spells of indigestion. He had hunger pains at bedtime, which were relieved by taking milk and crackers before retiring. During the harvesting season he had been accustomed to eating a heavy meal about 8:00 p. m. and would begin to have a burning type of distress, with much belching, about 2:00 a. m., which was relieved by drinking milk and eating crackers. He would also have distress in the afternoon, particularly after eating a large noonday meal. This would be relieved by eating something, or would continue until the evening meal. In the few years previous to his coming to the clinic the distress had come in cycles, lasting about a month at a time, with intervals of six to nine months of freedom. A few months before admission, the nocturnal distress had become more noticeable. There had been occasional emesis. There never had been any real colic in the upper part of the abdomen, although he recalled that for twenty years he had had some indigestion, but for the first twelve years it had not been as marked as it had been in the last eight years.

General examination revealed that the patient weighed 40 pounds less than what he said he had weighed five months before admission. The only thing of note in the blood count was that leukocytes numbered 12,000 in each cubic millimeter. Analysis of gastric content disclosed total acidity of 26 and free hydrochloric acid of 22 (100 c.c. of gastric content neutralized by 2.6 c.c. and 2.2 c.c., respectively, of tenth-normal sodium hydroxide). By aspiration, 110 c.c. of the test meal was recovered. Roentgenologic study of the gallbladder showed it to be functioning normally, and similar study of the stomach revealed a defect of a duodenal ulcer. The patient was hospitalized and further studies were suggested. Along with the gastric distress, there had been symptoms suggesting gallbladder colic.

Exploration, March 4, 1929, revealed adhesions around the duodenum, biliary cirrhosis, and a choledocholith. Choledocholithotomy and choledochostomy were performed. Convalesence was uneventful and the patient was dismissed from the hospital, March 18. It was noted, however, that on the ninth day of his stay in the hospital he had six loose, watery stools. This was six days before dismissal, although in those six days his stools had continued to be loose.

The patient returned, April 3, stating that his diarrhea had become worse a few days after leaving the hospital and had progressively increased in severity. On admission, the patient looked very ill, had a temperature of 100° F. with some abdominal distention and tympany, and marked tenderness along the line of the colon. The question of an obstructive lesion, with peritonitis, was raised. Failure was very rapid and death followed on the third day after readmission to the hospital. The anatomic diagnosis was acute, severe, ulcerative colitis.

Case 4 (Case 11 in the tabulation).—A woman, aged fifty-six years, came to the clinic March 9, 1927. A diagnosis of pelvic abdominal tumor was made and exploration was undertaken, March 13. Carcinoma of the right ovary, involving the uterus and anterior wall of the sigmoid colon, was found, for which bilateral oöphorectomy and salpingectomy, subtotal abdominal hysterectomy, and resection of a portion of the sigmoid, and colostomy were done. The pathologist reported squamous-cell epithelioma, graded 4. The patient made an uneventful convalescence and was dismissed from the hospital on the twenty-sixth day after operation, with an afebrile temperature and feeling fairly well. The last eighteen days of her stay in the hospital, however, there had been diarrhea, which had reached its maximum five days before dismissal, and the last few days it had seemed to be controlled by paregoric and bismuth. However, after the patient had left the hospital, the diarrhea had continued, and had become steadily worse, so that she returned to the hospital, June 30, four days after dismissal. From then on her condition became progressively worse, and she lost weight rapidly. In spite of the use of tincture of opium, tincture of iodine, paregoric, and other symptomatic agents, her failure was progressive and she died, July 10. The anatomic diagnosis was metastasis to the pelvic and abdominal aortic nodes, ulcerative colitis, graded 3, and pelvic abscess.

COMMENT

An interesting question arises concerning possible etiology of severe fulminating, fatal colitis, and its incidence after operation on the

DATA CONCERNING ULCERATIVE COLITIS AS A COMPLICATION FOLLOWING ABDOMINAL OPERATION

Case	Age, years, and sex	Diagnosis	Surgical procedure	Time of onset of diarrhea, days after operation	Death, days after operation	Cause of death
1	67M	Gastric ulcer (perforating)	Closure of perforation; drainage of abdomen	5	53	Ulcerative colitis; abdominal abscesses
2*	52F	Gastric ulcer	Knife excision; gastro-enterostomy	13	22	Ulcerative colitis; perforation of sigmoid
3*	59M	Gastric ulcer	Partial gastrectomy of posterior Polya type	4	29	Ulcerative colitis
4	50F	Subacute duodenal ulcer (perforating)	Posterior gastro-enterostomy	5	13	Ulcerative colitis
5*	63M	Choledocholith; biliary cirrhosis	Choledocholithotomy and choledochostomy	9	33	Acute ulcerative colitis
6	38F	Carcinoma of pylorus	Jejunostomy for inoperable obstructive carcinoma	3	9	Ulcerative colitis; beginning peritonitis
7	65M	Carcinoma of pylorus	Billroth 2 resection; posterior gastro-enterostomy	5	9	Ulcerative colitis; peritonitis; bronchopneumonia
8	62F	Intestinal obstruction	Cecostomy	Diarrhea first few days of illness	6	Acute ulcerative colitis; diverticulitis of sigmoid with obstruction
9	23F	Right tuboövarian abscess; left pyosalpingitis; subacute appendicitis	Right salpingo-oöphorectomy and left salpingectomy; appendectomy	6	22	Chronic ulcerative colitis; chronic ulcers of stomach; multiple loculate abscesses in peritoneal cavity
10	55F	Choledocholithiasis with biliary fistula; cholecystitis, graded 2	Choledochostomy; cholecystectomy	6	39	Ulcerative colitis; internal hemorrhagic pachymeningitis
11*	56F	Carcinoma of ovary fixed to sigmoid and uterus	Hysterectomy; oöphorectomy; resection of part of sigmoid; colostomy	8	58	Ulcerative colitis, graded 3; pelvic abscess
12	57F	Ovarian cyst	Right salpingo-oöphorectomy; appendectomy	6	17	Ulcerative colitis, graded 3; general peritonitis

*Reported in text of article.

upper part of the abdomen. It will be noted that in eight of the twelve cases (tabulation) operation was on the stomach or biliary passages, and in six of these operation was primarily on the stomach. In three of the cases, there were pelvic operations; in only one case was operation primarily on the large intestine, and that in a case of long-standing obstruction. The possibility of the occasional, or frequent, presence of organisms, either in the lumen or the wall of a diseased viscus must be borne in mind. Whether or not similar or closely related organisms occur in peptic, cholecystic and intestinal ulcers is not known. Rosenow,[3,4] frequently has isolated strains of streptococci from peptic ulcers and infected gallbladders, and many workers, including one of us (Bargen[1]), have found a diplostreptococcus in the ulcers of chronic ulcerative colitis. How closely these various organisms are related has not been determined. We have called attention to the occasional existence in the same person of peptic ulcer and chronic ulcerative colitis, and to the subsidence of the symptoms of the former with the treatment of the latter.

Also it should be noted that in 1929 two patients, whose condition clinically was like that of the twelve reported, on empiric grounds were given the specific immune chronic ulcerative colitis antibody solution[2] and recovered.

For those who might consider ulcerative lesions of the colon of this type to be on a metabolic basis, an answer would seem to lie in the rapid course which these cases followed. All of the patients seemed to represent average surgical risks except the one who had intestinal obstruction. True, all but two of the patients were between the ages of fifty and sixty-seven years, but in seven the results of blood counts were negative and in only one patient (case 10) was there noteworthy anemia, the concentration of hemoglobin being 37 per cent (Dare) and erythrocytes numbering 2,540,000 in each cubic millimeter of blood. Most of the patients had lost considerable weight; in case 6 the loss had been 60 pounds; in case 7, 24 pounds; in case 9, 30 pounds; in case 10, 30 pounds, and in case 4, 40 pounds; except for these factors, the preoperative condition of the patients was favorable. Furthermore, none of the patients had been exposed, either before or after operation, to any of the usual bacteria generally recognized as causing dysentery.

It would seem, then, that the causative factor was present at the time of the patient's operation and that postoperatively certain other factors were brought into play to cause the etiologic agent to become active.

SUMMARY AND CONCLUSIONS

Severe postoperative diarrhea, if it is found not to be due to any of the usually recognized causes of dysentery, may be of the type of chronic ulcerative colitis and can justly be treated as such.

As long as the cause remains obscure and the case is fulminating, and therefore adequate means of investigation of the cause are difficult to apply, any measures of combating the condition may be judiciously undertaken. The great value has been demonstrated of specific antibody solution prepared from immune horse serum in cases of chronic ulcerative colitis in which the etiologic agent, apparently, is the diplostreptococcus.[2] It seems reasonable, therefore, to include administration of this antibody solution in the therapeutic measures, or perhaps to think of it as the most effective of them. If the case does not yield promptly to this, ileostomy, with short-circuiting of the fecal stream, may be indicated. This operation has found favor in refractory or complicated cases of bacterial chronic ulcerative colitis and may be a life-saving measure.

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PERNICIOUS ANEMIA: AN HISTORICAL SUMMARY WITH ESPECIAL REFERENCE TO THE OCCURRENCE OF FEVER

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THE late Charles Lyman Greene[1] has defined Addisonian Pernicious Anemia as follows: "This is a primary anemia, probably invariably fatal, progressing slowly by remission and relapse, characterized by hemolysis and perverted hemogenesis associated with progressive and ultimately fatal extreme diminution in the number of erythrocytes in the circulating blood, the appearance of large numbers of immature red blood cells and a marked reduction in the hemoglobin with a relatively high individual cell hemoglobin content which results in a high color index." This gives a very clear idea of the anemia side of the disease, but we wish to emphasize in this paper that Addison's anemia consists not only of the anemia but of certain changes in the gastro-intestinal tract, and usually in the central nervous system. We believe that Dr. Greene's definition could be rendered more inclusive if it is specified that the presence of an achlorhydria is an essential invariable finding, in addition to which there is usually anatomical evidence of the existence of a glossitis. Furthermore, evidence at hand is conclusive that at least 80 per cent of the sufferers with this disease present signs and symptoms indicative of degenerative changes in the posterior and lateral columns of the spinal cord.

HISTORY

Osler, we believe, is credited with the statement, "Know syphilis and you know medicine." While perhaps not quite so true with regard to pernicious anemia, one can truly say, "Know pernicious anemia and know more medicine." The progress of our gain in knowledge concerning pernicious anemia has been very slow with the exception of two periods, that of the present and that from 1870 to 1880.

Coombe[2] of Edinburgh was the first to recognize the existence of this peculiar anemia as an individual disease, and it is very interesting to read that this canny Scot viewed it as "a peculiar disease, which will doubtless be viewed in different appellations." His prophecy has certainly been many times fulfilled. The next case to be recorded in the literature is that of Channing[3] of Boston, edited in 1842 in the New England Quarterly Medical Journal. There is very good evidence that the existence of an anemia of unknown cause and pathology, invariably fatal, had been recognized by the Boston clinicians for ten or fifteen years prior to this. Unfortunately for the credit of American medicine, however, they failed to differentiate it either from the anemia subsequent to multiple pregnancies or from the anemia of pregnancy. When we consider, however, that the so-called primary, or severe anemia of pregnancy is not as yet clearly differentiated from Addisonian anemia we need feel no especial chagrin at their failure.

These remain the two instances of this disease in the literature up to the time that Addison[4] first gave his now famous dissertation upon the disease of the suprarenal bodies in 1849. At this time, while recognizing that some of his cases did not have demonstrable pathology of these organs, it was not till his later publication[5] in 1855 that he clearly differentiated the two conditions, the one of the suprarenal bodies being now called Addison's disease, and the other idiopathic anemia being referred to as Addison's anemia.* Apparently, as is common in medical circles, attention was paid to the disease with manifest pathology but it is not until 1871 that we again find this idiopathic anemia receiving its share of the limelight.

In this period of twenty years I am able to find only one article of any detail, that of Habershon,[6] published in the Lancet of 1863. In a lecture on anemias he reported, with other cases,

*Attention should be called to the description of a fatal case of anemia corresponding in type to that described by Addison, published by Barclay[7] in 1851.

that of a woman, aged 40, in whom the disease had a gradual onset with weakness, a yellowish pallor, and with gastro-intestinal symptoms of pain, occasional nausea and emesis, alternating constipation and diarrhea, but, withal, not accompanied with cachectic wasting. The white blood cells were not increased in number. The postmortem examination was negative except for a fatty degeneration of the heart, especially prominent in the walls of the left ventricle. The state of the knowledge of this affection in 1870 seems to me to be well represented in Austin Flint's Principles and Practice of Medicine[8] (1868). He stated: "Addison has described cases of anemia occurring without any obvious causation, accompanied by general debility which progressively increases, at length ending fatally, without appreciable lesions of any of the vital organs. Cases of this kind are occasionally met with, especially in hospital practice. Addison distinguishes them as cases of 'idiopathic fatal anemia.' In a certain proportion of these cases the surface of the body, to a greater or a lesser extent, assumes a dark discoloration or a bronzed appearance, and in several successive cases the suprarenal capsules were found to be more or less disorganized. Addison inferred from these facts a pathological connection between disease of the suprarenal capsules and the bronzed hue of the skin. Clinical observation, however, shows that the two events are not uniformly associated." Certainly there remained much to be done, before the idiopathic anemia was to be firmly founded as a clinical entity.

With the increasing prominence of the Teutonic medical centers we find pernicious anemia re-discovered. The first paper on the subject then was that of Gusserow,[9] in Zurich. He reported five cases of severe anemia in pregnancy or the puerperium. The true value of these cases is doubtful. But in the following year, a colleague of his, Biermer,[10] published the paper which gave the impetus to the diagnosis and investigation of this disease. He claimed to have seen fifteen cases in five years, which at once placed the disease among the less common, instead of among the little known rarities. While one may doubt the authenticity of several of his cases, one can not doubt that, aside from the neurological aspect, he clearly recognized all the symptoms of Addisonian anemia. To quote from his paper in regard to the etiology: "Miserly and improper food, bad rooms, dehydration, especially protracted diarrhea, foster the progress of the disease and cause it." Such a viewpoint expressed today would classify the disease as a deficiency disorder. His division of the symptoms and their interpretation is no less modern. He classified them into eight groups: "1. Anemia-hydremic phenomena: great pallor, poor nutrition, but no atrophy of the fat cushions such as occurs in carcinoma and phthisis. Often a yellowish white facial color without jaundice. In far advanced cases, moderate edema-like puffiness of the lower eyelids, and feet and hands, occasionally ascites. 2. The corresponding anemia nerve symptoms: weakness, faintness, palpitation of the heart, etc. 3. Digestive disturbances, the sequences of the fatal loss of appetite: poor digestion, sometimes the feeling of pressure in the stomach; very often intermittent diarrhea. 4. Circulatory symptoms—murmurs in the heart and blood vessels, very often so loud that one must question the existence of a cardiac defect. The murmurs are systolic, though occasionally there is a diastolic in addition without a degeneration of the valve being found at post-mortem: at the base the systolic murmur is rougher than over the ventricle, where it is more blowing. . . . The heart action is as a rule hastened, and the heart sounds diffuse, undulating and not vigorous. 5. Fever is uncertain; however, it is observed transitorily in nearly all cases. . . . Distinctly local basis for the fever cannot be found. 6. The retinal hemorrhages are interesting because they are almost constant. 7. Occasionally there were cutaneous hemorrhages, small petechia. Hematuria and epistaxis are occasionally observed, albuminuria only exceptionally. 8. On the contrary, capillary hemorrhages in the brain, on the arachnoid side of the dura, and in the pia, were found in several cases without characteristic symptoms during life. . . . All cases ended in death, with one exception, which was slightly improved." For a clinical description of the appearance of the patient, this could be regarded as entirely up to date with the exception of the neurological findings and the glossitis. At necropsy Biermer found only a moderate fatty degeneration of the heart, especially under the endocardium lining the left ventricle, and what he termed "fatty degeneration of the capillaries" by which he explained the capillary hemorrhages throughout the

body. Why this paper, which is in reality very short, brought the disease into general notice and gave the impetus for the great increase of knowledge which came about in the next ten years, is unexplained. That is just what happened, however, especially in Germany, where the disease is known as Biermer's anemia, and, we believe, justly.

Two years later, Quincke's article[11] appeared, and contained the first glimmering of knowledge concerning the pathological physiology of the disease. By the ferrocyanide test, he was able to demonstrate, grossly and microscopically, the presence of a substance giving the iron reaction in the liver, kidneys, and pancreas. This he verified by chemical analysis, which showed conclusively that there was an increase of iron. Quincke failed to grasp the entire importance of this, which we now know under the name of hemosiderosis, for he thought that possibly this storage of iron could be accounted for on the basis of that found in the medicine that had been administered. In the same year, 1874, Immerman[12] published an extensive dissertation on the subject, in which, however, he added nothing new. Eichhorst[13] in Leipzig in 1874 and again in 1884 was the first to call attention to the peculiar shape of the red blood cells in what he called Biermer's anemia. We in America should be proud that the year 1875 saw the publication of an extensive review of this disease by Pepper,[14] and to him should belong the credit of first clearly describing the replacement of the yellow marrow of the long bones by red marrow consisting of distinctly blood forming elements. He was also the first to mention arsenic in the treatment of the malady. Cohnheim[15] in Germany in the following year confirmed, independently of Pepper, the replacement of the yellow by red marrow, as did Lepert[16] in Paris. The year 1877 was notable for the contribution of Scotland, in the form of a case report by Bramwell[17] of Edinburgh, in which for the first time the presence of nucleated red cells was recognized, clearly described, and well illustrated. Previous to this, while changes in shape had been recognized as common to this condition, nucleated erythrocytes had never been described. Bramwell also brought before the English and continental physicians the value of arsenic in this malady, since the two cases in which he used it recovered. Bramwell possessed true Scottish caution, however, for we find him making this statement, "Although the results were all that could be wished for, I would not for a moment have it supposed that arsenic will be found a specific for this disease."

While such rapid strides were being made in the understanding of blood conditions, gastroenterology had begun to develop. In 1870, we find that Samuel Fenwick[18] had reported a case of primary gastric atrophy. Upon reading his case report, one finds that he was in reality describing pernicious anemia, and that he had most beautifully demonstrated the existence of achylia by experimental means. We can do no better than quote his remarks: "It is well known that an infusion of the gastric mucous membrane when mixed with dilute hydrochloric acid will dissolve albuminous substances; and I have found, by numerous experiments, that one ounce of such an infusion will on the average digest four grains of hard-boiled white of egg. I carefully scraped off the mucous membrane from the splenic and middle regions of the stomach in the preceding case, and infused it in two ounces of distilled water, along with half a dram of dilute hydrochloric acid for twelve hours. A cube of hard boiled white of egg, fifteen grains in weight, was then digested for nine hours at blood heat, but at the end of this period, the albumin had not lost in weight, and the only change produced was a slight softening on its surface. This experiment, therefore, confirmed the conclusion drawn from the microscopical examination, that the gland-structure of the stomach had been so seriously diseased that it could not have been capable of performing its functions during life." Austin Flint[19] of Philadelphia in the following year reviewed Fenwick's paper and added four cases of his own, all fairly typical of Addisonian anemia. In these cases he followed Fenwick's lead and diagnosed primary gastrict atrophy. Fenwick[20] in 1877 reopened the subject with a paper in which were reported seven cases, four with necropsy. These were all typical of Addisonian anemia, and he seems to have been aware at least of the similarity; nevertheless he attributed the accompanying anemia, perhaps correctly, to the gastric glandular atrophy which he had so beautifully demonstrated.

Thus the first great period of activity in research upon this subject was brought to a close with the appearance early in the 80's of two ex-

haustive reviews of the subject in English, the first by Coupland[21] in 1881, and the second by Pye-Smith[22] in the following year. We believe the two are equally exhaustive and reliable, but we find that the second is readable, whereas the one by Coupland is written in a style both difficult to follow, and not clear as to points of emphasis. The first point to impress the American reader in both articles is that the British ire had been aroused at Biermer's claim to have discovered the disease, and both authors wrote insistently and at length on the priority of Coomb and Addison. Coupland tried to incorporate pernicious anemia as a special kind of chlorosis, but seems to us to have failed, most miserably. Pye-Smith was thoroughly imbued with Guy's hospital spirit, and would permit no one to usurp Addison's priority in the description of a new clinical entity. Both papers admirably summed up the knowledge to date.

The period from 1880 to 1926 was one devoted to the proof and amplification of the signs and morbid changes observed in the era preceding it. It was in this period that we had the development of the aniline dyes by Ehrlich,[23] with its corollary, a great advance in the knowledge of cellular detail. By this means we not only had the work of Eichhorst and Bramwell confirmed, but we had the recognition and the anatomical description of the two types of erythrocytic development, i.e., the adult normoblastic one and the embryonic or pathologic megaloblastic type. It was in this same period, also, that it was conclusively demonstrated that megalocytes and megaloblasts are only found in primary anemia. Following this came the work of Price-Jones,[24] another Guy's hospital enthusiast, who measured the size of the red cells in normal individuals and in persons suffering from the various types of anemia. By this method, he gave us another diagnostic criterion in Addisonian anemia. He found it to be pathognomonic of this condition for the red cells to show two distinct variations in size from that of normal blood, or that of blood from the other anemias. The first and most important is that the average diameter, instead of being 7.5 micra as it is with normal individuals, or less as it is with hemolytic jaundice, is increased to 8.5 or even 9.5 micra. This is certainly a well marked difference. The second pathognomonic variation that he observed was in the range of the size of the cells; whereas in normal blood the size may run from 6.5 to 8.5 micra, in pernicious anemia a range from 4.5 to even 11 or 12 micra is the rule. This does not occur in any other form of anemia.

Along with the increase in our knowledge of the histopathology of the blood, we find occurring an increase of interest in the study of the bone marrow changes. Beginning with a paper in the 80's by Osler and Gardner[25] various observers[26] noticed the distribution and the appearances of the red marrow, till we have in a paper by Peabody,[27] of Boston, the culmination of such studies. He and his associates in Boston developed a technic in which, by means of local anesthesia, they trephined through the shaft of the tibia and curretted out a small portion of the marrow for histological examination. The value of this lay in the reporting of the condition of the marrow during life and not after the person succumbed to the disease; thus he was enabled to get marrow from all stages of relapses and remissions. He stated that from their necropsy observations they believed that the replacement of the yellow by red marrow took place first in the bones of the trunk, next in the femurs and humeri, and lastly in the legs and forearms; while in a remission the opposite was true, the red marrow disappeared first from the bones most distal from the trunk, and only in a complete remission were absent from the vertebræ, ribs, etc. Hence, a biopsy from the tibia gave the most sensitive index of the stage of the disease. He found that during a relapse the fat practically disappeared to be replaced by hemopoietic tissue, consisting largely of columns and cords of megakaryocytes, some of the myeloid series, and a few of the normoblastic type. Mitoses were rare in the latter, occasionally found in the myelocytes but exceedingly numerous among the megakaryocytes. The hyperplasia was so extensive that the venous sinusoids were practically collapsed. Their outlines were distinguished only by the aid of the hemosiderin granules contained in their walls. In the beginning of a remission there was a distinct difference in the picture; crowding was not so intense, and the preponderance of mitoses had shifted from that of the megakaryocytic series to that of the normoblasts. When a remission was well established, the fat cells had returned and occupied the larger part of the space normally theirs. Even when the remission was practically

complete, however, cords of megakaryocytes existed among the fat cells, though mitotic figures among them were conspicuous by their absence. The conclusion to be reached from this seemed to be that, though the organism had largely returned to the normal method of blood manufacture, the possibility of reversion to pathologic type was ever present.

Of the two additional morbid changes that have been described since 1880, that of the central nervous system holds the priority. Lichtheim[28] in 1887 described changes in the posterior and lateral columns of the spinal cord in three cases of severe anemia. This was shortly followed by three additional cases described by Minnich.[29] Later the spinal cords of twelve additional cases of Addisonian anemia were examined by Minnich, and, though they had not complained of neurological disturbances during life, the same type of change, though not to the same extent, was found to occur in their cords. In 1895, Bowman[31] collected the literature and with his own case was able to find eleven Addisonian anemia patients who had complained of distinctly neurological symptoms during life. Bowman's description of the gross changes is as accurate today as it was when he wrote it, thirty years ago. "In every instance there was degeneration in the posterior columns, most marked in Goll's tract, but also involving more or less of the posterior-external columns; but in the latter case leaving a strip of undegenerated white matter on the inner surface of the posterior gray cornu. The posterior roots and Lissauer's tract were invariably intact. In four instances (66 per cent) the lateral columns were also affected, the degeneration being situated chiefly in the outer and posterior portion, and in three of these cases similar changes were also observed in the anterior columns, chiefly in the situation of the direct pyramidal tracts."

Since that time, neurological signs have been increasingly looked for, so that now in at least 80 per cent of the cases they are reported as being present.[31,32] The location of maximum areas of destruction as occurring in the lower cervical and upper thoracic levels of the cord have since this time been abundantly confirmed. The best description[33] that we have been able to find of the histology of the process is as follows: "The microscopical details are typical in that they begin around and spread from the vessels . . . Beginning as small lesions, these latter coalesce in such a manner as to give the cord a cribriform appearance." In 1923, Woltman[32] of the Mayo Clinic gave a paper on the mental changes found in pernicious anemia. He agreed with Barrett[34] that lesions similar to those described in the cord did occur in the brain. Furthermore, Woltman found that 4 per cent of the cases of pernicious anemia that came to the Mayo Clinic had a more or less marked mental disorder and he expressed himself as agreeing with the findings of others in smaller series, namely that these patients were especially prone to ". . . apathy, indolence, decreased mental work, loss of memory, delirium, shallow confusion, stupid indifference to surroundings, to external impressions and to the disease itself; instability, shallow confusion, with impairment of ideas of time and place, abeyance of the mind, loss of inhibition, peevishness, gradual mental deterioration, varied by control, good temper, and an angelic disposition for longer or shorter intervals; somnolence, with a tendency on being aroused to exhibit a certain degree of mental confusion, particularly to surroundings, which may manifest itself in a delirium of a low quiet type, a continuance of the dream state which the patients can not shake off on being aroused, and which usually subsides spontaneously on further stimulation." With regard to the etiology and prognosis in these mental cases, the same author expressed himself as follows: "Why it is that some patients develop psychosis and others do not, is a hard question to answer. It may be that constitutional factors play the deciding part; this was very evident in some of our cases, but by no means in all . . . It is usually said that the mental disturbances proceed pari passu with the intensity of the anemia . . . but it does not invariably hold for the cases in which the more marked mental disturbances are exhibited." Thus we see that there is a process of gradual disintegration in both the spinal cord and brain of some of the sufferers from this malady.

Turning now to the gastro-intestinal side of this disease, we find the second of the new facts discovered in this period of slow ramification of knowledge. This consisted of the description in 1888 by William Hunter[35] of a peculiar form of glossitis occurring in patients suffering from Addisonian anemia. In 1903 he further ampli-

fied this, in the report[36] of 25 cases. This article he devoted to two objects: first, a defense of the original view of Addison concerning the disease; and, second, its etiology. From what we read about him, William Hunter was of a somewhat fiery disposition, very prone to take sides, and argue violently in favor of his convictions. Fully half of this article was filled with the lauding of Addison and his British contemporaries and the satirizing of the viewpoints of Biermer, Eichhorst, and especially Quincke. To us, the final touch of irony is that the especial fault that he most deeply abhorred in them, namely the assigning of a cause to Addisonian anemia, he himself committed in the second section of his paper. His opinion can be best expressed in his own words: "In all the cases observed during life, 25 in number, and in the cases, 7 in number, in which postmortem examinations were obtained, I found certain infective lesions in the mouth, tongue, stomach, or intestines—either singly or associated with each other. These were of two classes: 1, a special form of glossitis (in every case); 2, septic lesions, viz. (A) a preceding or existing 'oral sepsis' (24 cases); (B) 'septic gastritis,' the condition I described (1900) as a common result of the long continued oral sepsis, causing finally gastric atrophy (more or less in every case and most intense in 3 cases); (C) 'septic enteritis,' e.g., a croupous enteritis, patches of congestion and catarrh, follicular enlargement, and patchy colitis (3 cases). With regard to these, the point to be emphasized now in view of the significance I shall subsequently attach to them is: in no cases were these lesions either in anatomical character or severity sufficient of themselves to originate the intense anemia by any interference with nutrition they may have been capable of producing." And again under special etiology, "There are two classes of lesions which I consider of importance in this relation—1, a hemolysis of special degree and character, well shown by the analyses in the present series of seven cases; and, 2, a glossitis, observed in every case, having the peculiar relation to the onset of the anemia, and clinical character suggestive of its being of an infective nature, described by me in 1900. Histological examination in seven cases shows that it has even more striking pathological features, and in all three cases bacteriologically examined, these are associated with, and presumably dependent upon, a deep seated pure streptococcal infection of the substance of the tongue." One wishes that he had been more detailed in descriptions of this glossitis, but he evidently was describing the same phenomenon that Dr. Schneider[37] of Minneapolis had recently so beautifully shown, namely that beneath the mucosa of the reddened areas on the tongue in active cases of pernicious anemia, there can be seen and isolated pure colonies of streptococci viridans.

The percentage of pernicious anemia cases having achylia gastrica had risen steadily with our increase in knowledge of this disease. From statements made in 1890 that it was said to occur frequently, we find that in 1910 achylia occurred in over 90 per cent of the cases; while at the present time the diagnosis of Addisonian pernicious anemia can not be made without the proven absence of hydrochloric acid from the stomach.[31,39] Along with the increasing importance of this achylia, there has been developing a more and more active discussion as to its duration. At the present time it is generally conceded that it exists prior to the development of the disease, but as to how long, there are two very distinct schools. Hurst[31] in England strongly affirmed the hereditary origin of this gastric malfunction and pointed to the several pernicious anemia families that could be found in literature, and to the fact that the blood relatives of pernicious anemia patients show the absence of free hydrochloric acid from the stomach much more frequently than does the population as a whole. Faber[39] in Copenhagen was equally emphatic, however, in stating that the origin of this achylia was an infection, and he pointed out that in all these cases of achylia there could be found, by careful search of the past history of the patients, a story of an acute gastric-intestinal infection at some time in their lives. The correctness of either opinion is probably of more academic than practical importance.

Along with the increasing knowledge of the gastric secretions, there has been developed since 1880 the beginning of the chemistry of bile and hemoglobin constituents in the feces and serum. Eppinger[40] and Schneider[41] found that in Addisonian anemia the total amount of urobilin found in the feces for twenty-four hours was materially increased above that of the normal. Schneider[42] carried this work further and has attempted to show an increase of urobilin in the duodenal con-

tents. While this is the only thing discovered that is strictly new, yet it has rendered previously observed facts into mathematical terms and perhaps cast some physiological light on the descriptions of the yellow color of the blood plasma which was noticed and remarked upon by the original writers on pernicious anemia. Foremost among investigators in this field of serum chemistry had been Van den Bergh,[43] whose test for bile pigment in the blood is now known to every junior medical student. He found that in relapses of pernicious anemia there was a delayed positive reaction of the serum. This is generally interpreted as meaning that there is in the blood an increase of bile pigments, which have not been excreted by the liver, in other words a mild degree of non-obstructive or toxic jaundice. The explanation offered for the fact that the reaction takes place only with the addition of alcohol to the serum, and that the color of the pernicious anemia patients is distinctly different from that of the ordinary jaundiced ones, is that in the excretion of these blood pigments by the liver into the bile they are slightly changed in chemical structure. The same increase in the pigment matter of the serum can be shown by the icterus index. Thus the period of slow increase in knowledge is brought to a close and we have, in 1926, Addisonian anemia pictured as an idiopathic anemia characterized by remissions, a high color index, a wide variation in the size of the red blood cells, but on the whole distinctly larger cells than normal, a quantitative measurement of the yellowness of the blood serum as expressed by the Van den Bergh and the icterus index. We have it demonstrated that the majority of cases have at some time a glossitis, from which can be isolated pure cultures of streptococci, that almost if not invariably there is an absolute achlorhydria; and that there will be signs of degenerative changes in the central nervous system in the vast majority of cases.

We come now to the second period of rapid development in our knowledge of pernicious anemia. This began with the publication by Minot and Murphy[44] of a paper dealing with the therapeutic effects of a vitamin-rich diet, containing a large amount of fresh liver. Since Bramwell's description[17] of the therapeutic effect of arsenic in 1877, there had been little progress in the treatment of this disease. Transfusion had become a simpler and a safer procedure, but at best, it seemed only to hasten the spontaneous remissions, and did not seem of great value in the severest cases when they were on the down hill grade. In the ten years preceding this paper, various dyes had been tried with more or less indifferent success. Two Iowa physicians[45,46] have reported upon the favorable effect of intravenous mercurochrome; additional reports as to its value we have been unable to find, though numerous cases of other diseases in which it has been used with disastrous results abound. Ultraviolet light has had its advocates[41,49] some using it alone, others with one of the aniline dyes (eosin or gentian violet) as a sensitizer. A review of the incidence of relapse in this disease in relation to the time of the year did not give any proof of the lack of ultra-violet being a factor in the causing of the downward trend.[50,51] Some investigators, basing their hopes on the origin of the disease in gastro-intestinal infection, have tried to inhibit the growth of bacteria in this region. The simplest of the procedures with this in view was that advocated by Hurst[31] of Guy's hospital, who believed in large doses of dilute hydrochloric acid, given at least once a day on an empty stomach. In this country, prior to the liver regime, acriflavine and gentian violet were frequently given.[52] Favorable results have not been striking, to say the least.

Various surgical procedures have been tried in the treatment of this disease. Hartmann[53] and Moynihan[54] have both observed the development of an anemia corresponding to Addisonian anemia in all its characteristics following the complete removal of the stomach; the significance of this they have not attempted to interpret. On the theory that the disease is due to an increased blood destruction, splenectomy has been resorted to. Giffin and Szlapaka[55] reported a series of fifty cases in 1920. They came to the conclusion that splenectomy would bring about the beginning of a remission in nearly all cases, and that in 20 per cent it would lengthen the duration of life. Wm. Mayo[56] expressed himself as follows concerning this procedure, in 1925: "In this group [pernicious anemia] there were 62 cases and 4 deaths. Again it is difficult to estimate just how much good splenectomy has done. Immediate improvement practically always oc-

curred. Some of the patients have been in good condition and able to work for over five years. That there is a small group of atypical cases, that are as yet classified as pernicious anemia, and in which great benefit will be derived from splenectomy, there can be no doubt. Generally speaking the younger the case and the shorter the duration of the disease, the better the prognosis." Much more interesting are the results obtained by ileostomy. Dixon, Burns and Giffon[57] have reported six cases in which this procedure had been used, and have summarized the foreign literature. Two of their cases died from diseases other than pernicious anemia, two had a return of the anemia, while two remained well. They and other investigators have found that the cases that stayed free of the recurrence are those in which the terminal ileum lost its colonic type of bacteria and reverted to the normal following operation. This is certainly very interesting, though not at all conclusive, and supplies a fact upon which to base the belief that the disease is a toxic syndrome produced by bacteria in the intestines.

In connection with the theories of the toxic or bacterial origin of this disease, the experiments of Torrey and Kahn[58] should certainly be mentioned. They found that the injection of B. Welchii toxin into the tibial marrow of rabbits and monkeys gave a chronic, persistent, often fatal, anemia, characterized by a blood picture similar, at least, to that of human pernicious anemia. The intravenous injection of this same toxin was not accompanied by more than a transitory anemia.

Murphy and Minot[44] adopted a diet in 1926 which contained a high vitamin content and a large amount of liver. They felt that possibly avitaminosis had something to do with the production of the anemia, and in their choice of foods they followed very closely the suggestions of Whipple. Whipple,[59, 60, 61] who had been very much interested in the study of anemia in dogs for a period of years, observed that his animals that were kept anemic by bleeding would regenerate blood faster if they were on a diet containing a large amount of liver and kidney. On the other hand, Koesler[62] and his co-workers had been able to produce in aimals an anemia that resembled pernicious anemia in its blood features by the withholding of Vitamin A. When this element was supplied there occurred a marked period of blood regeneration. Concerning their diet as used in 1926, Minot and Murphy[44] state: "That the dietetic treatment is of more importance than hitherto generally recognized. The diet we have selected is one composed especially of foods rich in complete protein and iron, particularly liver, and containing an abundance of fruits and fresh vegetables, and relatively low in fat, ... Following the diet, all patients showed a prompt, rapid, and distinct remission of their anemia, coincident with at least a rather marked symptomatic improvement, except for pronounced disorders due to spinal cord degeneration." Since that time the medical world has devoted itself to the feeding of liver, and the watching of what has happened. It seems regretable that there has been no further follow-up of the work on ileostomy, or on the ultra-violet light treatment.

Investigation into what happens and why, in these cases, is intimately bound up with a class of red cells known as the reticulocytes. These are red cells in which the supporting stroma can be brought out by means of staining with cresyl blue. The method that we have used is the mixing of a drop of blood with a solution of this dye, then spreading the drop in the ordinary way to make a smear. After drying rapidly, this is stained with Wright's blood stain. The reticulocytes show themselves as red cells plus a network, more or less incomplete, of blue staining material. The work of Cooke[63] has proven quite conclusively, we believe, that this is an indication of immaturity, consisting probably of an increased permeability of the lipoid envelope encasing the cell. These reticulocytes are present in normal blood to the extent of about .5 per cent of the red cells. In conditions of increased blood production, they rise to 3 or 4 per cent, which is the usual figure that is obtained in Addisonian anemia prior to the beginning of liver therapy. Observers[64,68] agree, however, that within three to ten days after the beginning of adequate liver feeding, there is a rapid rise in the number of circulating reticulocytes. Only two manifestations of successful therapy can be noted before this rise: within a day or two after liver is begun, the patient begins to feel better, noticing that his languor is less,

and that his appetite is increasing. The second manifestation is even more striking. As we have said, in this disease, there is an increase of the bile pigments of the blood; just before the reticulocytes begin to rise, this rapidly drops to the normal. No one has an explanation that accounts for this phenomenon. The reticulocyte response beginning in the first week rapidly increases until the third week. The height to which the count of these cells rises seems to be quite definitely inversely proportional to the red cell count prior to the beginning of treatment.[64] Increase of the red cells and the hemoglobin value rise more slowly and do not reach their peak until a month or more after that of the reticulocytes. The color index at the same time becomes lower, which is, of course, due to the return of the normal sized red cells. The influence of liver therapy on the nervous and the gastrointestinal findings is certainly not marked. We know of only one case in which the hydrochloric acid was supposed to have returned and of only one case in which gross neurological findings have changed for the better.[70] It is to be expected that the paresthesias will improve; all authors agree on this, especially emphasizing that it may not be marked until after the blood count is well over four million. Rubert[69] is the only person who has so far recorded the disappearance of a gross neurological syndrome; and these occasionally disappeared prior to liver therapy. The junior author well remembers a case (No. 39345 University of Minnesota Hospital) that he saw while an intern, in which the patient had been seen and diagnosed as a well advanced case of posterior-lateral degeneration seven years before he was admitted to the medical service of the University of Minnesota Hospital, suffering from a high grade anemia, which was completely typical of that described by Addison. Careful neurological examination at this time, however, showed nothing more than a very mimimal disturbance in vibration sense.

The effect of liver seems to be almost specific for this one disease. Only two other conditions give a response at all comparable and they are the pernicious anemia of pregnancy, and sprue.[70] In these occasionally the reticulocytes will give a rise that is comparable to that which occurs in Addisonian anemia. In all other forms of anemia, the benefit of liver and kidney feeding is that of a non-specific; that is, any other equally iron-rich food would give an exactly similar rise in the hemoglobin values, and there is no accompanying response of the reticulocytes.

Work has been done on what it is in liver that gives this specific response, and the Eli Lilly Manufacturing Company was the first to perfect a potent extract. West,[71] of New York, who has done so much work on the problem of isolating the active constituent, believes that it is a polypeptide. The finding of an almost specific for pernicious anemia, in a substance that is certainly in the same general class of compounds as vitamins, has thrown the question of etiology of the disease again into the guessing contest. There are at the present time two opposing views. The newer view points to the therapeutic effect of liver, and indicates that we are dealing with a deficiency disease. Means and Richardson,[72] for instance, make the following statement: "It would seem fair to assume, in view of the new facts, that pernicious anemia is in some sense or other a deficiency disease, rather than an infectious, toxic, or neoplastic one . . . .; but it seems doubtful that pernicious anemia bears more than a slight resemblance to any of the other deficiencies with which we are now familiar. It is not a simple avitaminosis. Thus far it (the active principle) has not been found in plants, and unless vegetable sources are subsequently found, we are forced to conclude that some animals, at least all such as can live strictly vegetarian existences, are capable of carrying out its synthesis." And as to the significance of the pre-existing achylia, they summarize the work of Castle[73] as follows: "Working on this hypothesis [that the achylia had something to do with the genesis of the disease] he [Castle] showed that response similar to that obtained from feeding liver could be elicited in the majority of patients with pernicious anemia studied, by the feeding of skeletal muscle previously digested in a normal human stomach." Thus we have both sides recognizing the importance of the achylia, but upholders of the infectious or toxic theory have much in their favor. They quote widely the work of Macht,[74] which is perhaps best summarized in his own words: "1, Phy-

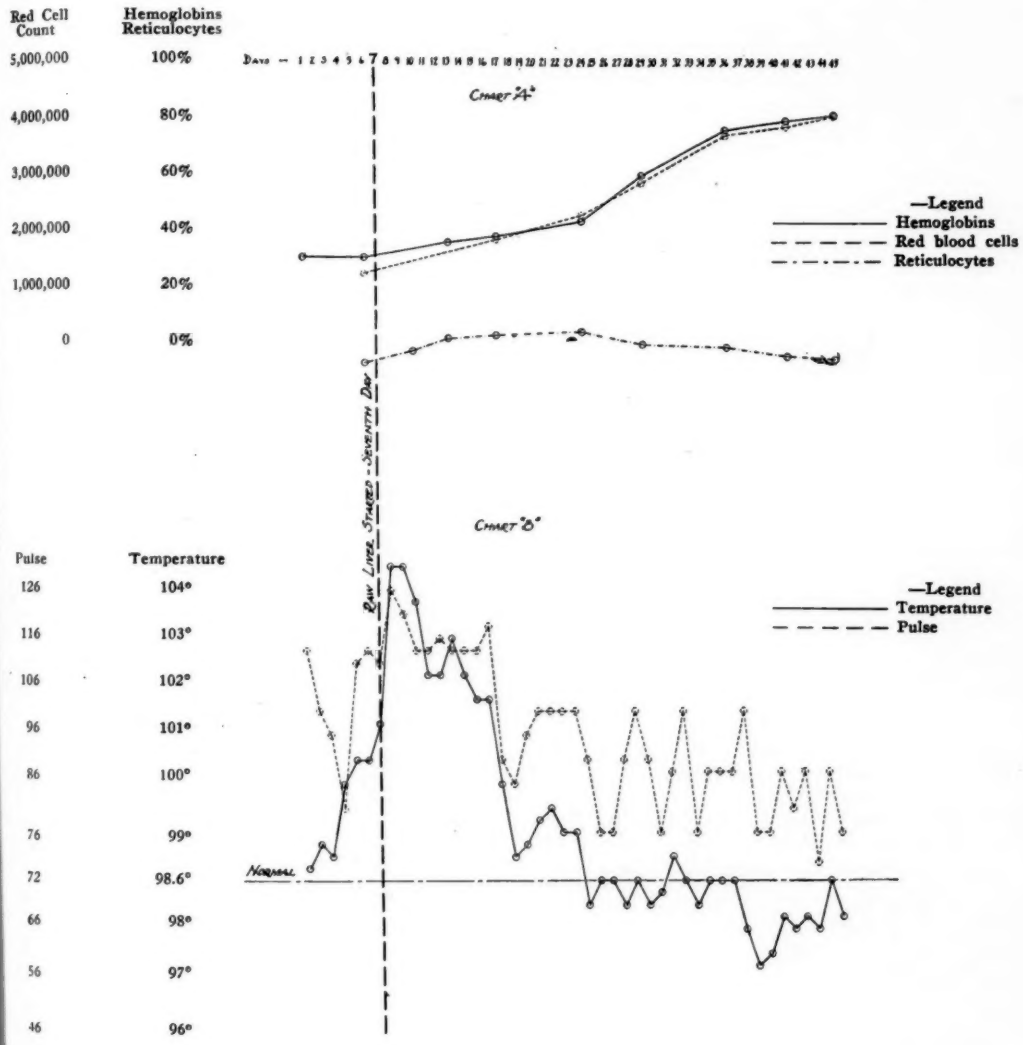
topharmacologic examination (consisting of comparing the rates of growth of seedlings in normal and anemic serum) of the blood serum from pernicious anemia shows that such serum is very toxic for plant proptoplasm, and thus suggests a toxin as the etiologic factor in this disease. 2, This phytotoxic property of pernicious anemia serum is not shown by blood serum specimens from various other blood diseases and is in this way useful in the differential diagnoses. 3, Irradiation of the pernicious anemia serum with ultra-violet rays in quartz containers renders the serum less toxic, and that effect can be increased by the addition of certain photodynamic sensitizers, e.g., eosin. 4, No treatment entirely destroys this toxicity, though both the liver and the light treatments decrease it." The fallacy in this chain of reasoning is, of course, that while it shows the presence of toxic substance, it does not differentiate whether this is the cause of the disease or one of the results of it. The most conclusive work, or at least that which it is going to be hardest to overthrow, is the work of Hunter[35] and Schneider[37] with the finding of streptococci beneath the mucosa of the tongue. The experimental work on the production of Addisonian-like forms of anemia in lower animals by means of the toxic products from various bacteria (streptococci and bacillus of Welch[75, 76]) does not seem to us conclusive. Even less well founded are the theories that the anemia is produced by bacteria in the stomach and duodenum (especial prominence has been given to the streptococcus longus[31] in this connection).

Thus, at the present time, we can say that pernicious anemia is a high grade state of anemia, characterized by abnormal findings in three of the great functional units of the body, to wit: first in the blood, where the most characteristic things are the anemia, the increase in size of the individual red cells with the consequent high color index, the replacement of the yellow marrow by red, embryonic, hemopoietic cells, and in the reticulocyte response to liver therapy. In the gastro-intestinal tract we have constantly a preexisting achylia and a peculiar form of glossitis that develops at some time during the disease. In the central nervous system we have perivascular areas of degeneration in the posterior and lateral columns of the cord, and less frequently in the brain.

TEMPERATURE CHANGES

It has long been a mootable question as to whether the presence of a severe anemia will of itself give rise to temperature. It is exceedingly hard to determine this. Practically all temperature in high grade anemia can be laid to the existence of an infection within the organism. Hence, to separate the role of infection and anemia in the causation of pyrexia is almost impossible. In primary anemia, the one anemia in which infection may not play a role, it has been long recognized that a temperature of a totally irregular type and course is characteristically present. This fact was first noticed by Biermer,[10] who differentiated it from the fevers of typhoid, typhus, and malaria by its extreme irregularity. He attempted to find an anatomical basis for it, looking especially to the occurrence of hemorrhages to coincide with the peaks of the temperature curve. In this, however, he was unsuccessful. All observers since his time have noted the temperature, and, according to their views as to the cause of this disease, the temperature was explained either on the basis of a toxemia or by analogy to the severe luetic anemias. They pointed to the temperature as a manifestation of the degree of anemia. Hunter, in the 80's and 90's, used the presence of a temperature as a strong argument in favor of the infectious origin of this disease. All authors commented on the irregularity of the fever and the fact that it may have a low or high range. All agreed also that when the patient is in extremis the temperature will fall to below normal. Cabot,[50] writing in Osler's System, commented on the fact that he had witnessed cases in which the degree and duration of fever forced the consideration of typhoid in the differential diagnosis. One cannot obtain any definite statement as to the significance of the temperature, but by reading various papers on the subject, one gathers the impression that temperature is significant in a well developed case and is not to be considered either as an early or as a late phenomenon. It is probably present largely when the patient is on the downward path. In the case reported below, the occurrence of an exceedingly high temperature was very striking. As is characteristic, the patient felt better than she had felt for days, when

her temperature was 103.8. As will be noticed from the chart, this was very shortly after the commencement of liver therapy. It is unfortunate that we did not obtain blood pigment studies, but, if we may quote Russell,[76] "The icterus index in these cases becomes normal prior to the rise in the reticulocytes." Thus, in our case the dropping of the icterus index from a high figure to normal would have been during this period of pyrexia. It seems to us that, while this is an unproved fact, it coincides with certain suggestions as to the nutritional and metabolic disorders manifested in Addisonian anemia. This occurrence of temperature would correlate with the finding of Alt,[77] who observed in five cases of this disease a positive nitrogen balance of marked degree immediately after the beginning of therapy.



Case Report

Hospital number, 1388; female; 38; married; occupation housewife.

A housewife, aged 38, was first seen in May, 1927. At that time she complained of weakness of a month's duration. The patient appeared very pale at the time

and had a rapid heart with a hemic murmur. Hemoglobin was 50 per cent.

We next saw the patient on March 19, 1929, at which time she complained of the same tired feeling that was present two years previous. In addition she was very nervous, had a humming in the ears, and a pins and needles sensation in the feet and legs, extending as high as the knee.

Family history was unimportant. The latter of her two pregnancies was nine years ago.

Physical examination. The patient is well developed, poorly nourished, and lying quietly in bed in no apparent pain. The skin is very pale, with a slight yellowish tinge. The hair is dry; it is not gray. Eyes react to light and accommodation. No nystagmus. No coloring of the sclera. Nose and throat negative. Mouth: upper and lower plates. Tongue very smooth with two reddened areas along the edge. Neck: slight enlargement of thyroid, over which can be heard a systolic but not a diastolic bruit. Lung excursion is normal; resonance normal, and no râles. The heart is normal in position and size. Apex beat very forceful and no murmur is heard. Pulse 110. B. P. 130/80. Abdomen slightly scaphoid; no point of tenderness. Neither liver nor spleen are felt. No trophic ulcers or other abnormalities of the extremities.

Special examination: ophthalmoscopic examination shows normal disc with normal arteries and veins, the only exception being a moderate compression at some of the arterovenous crossings. There is no beating or any evidence of either old or recent hemorrhage. Neurological: cranial nerves negative. Abdominal reflexes negative. Neither the biceps, triceps, knee jerks, nor ankle jerks could be obtained. Over the entire body up to the level of the sternum there is a complete absence of vibration sense. There is little or no disturbance as to touch and none as to muscle pain. Position sense is markedly decreased in the left foot and to a lesser extent in the right.

Laboratory: urine examination upon many occasions was negative, both chemically and microscopically. Blood counts are shown in the chart. The smear shows anisocytosis, poikilocytosis, and increase in size of the red cells. White cells are essentially normal. Van den Bergh and gastric secretions were not done.

SUMMARY

1. The existence of high-grade idiopathic anemia, progressively fatal, was first described by Coombe[2] of Edinburgh in 1820. It was later redescribed by Channing[3] in 1842, Addison[4] in 1849, and Biermer[10] in 1872.

2. Pathological knowledge of the disease was complete by 1880 except for the neurological findings which were added in 1887, the glossitis in 1889.

3. Arsenic was first used by Bramwell[17] of Edinburgh in 1877.

4. The period of liver therapy was inaugurated by Minot and Murphy[44] in 1926 and has reopened the controversy as to whether the disease is essentially a metabolic disorder or the sequela of a chronic infection.

5. The occurrence of temperature has been noted since Biermer's original description of the disease. Its significance is doubtful, but its occurrence in the case reported coincided with a period in which there is a reduction to normal of the icterus index and a marked nitrogen retention.

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SYRUP OF ALFEMINE, ET AL

Sherman L. Divis, Ph.D., is Professor of Chemistry and Director of Nutritional Research in the Indiana University School of Dentristry. He is neither a physician nor a dentist. During the past few years Professor Davis has been doing a good deal of lecturing before dental societies. In his talks Professor Davis recommends certain proprietary medicinal products, four in number: "Syrup of Alfemine," "Vicodol," "Caperoid Tablets" and "Vicaperol Capsules." All of these products used to be manufactured by the Ucoline Products Co. of Indianapolis. The manufacture and distribution of these products has been taken over by the Rochester Laboratries, Inc., Rochester, Minn. It appears that the Rochester Laboratories distribute the preparations on a royalty basis; the royalties being turned over to the trustees of Indiana University. Professor Davies does not receive any part of the royalty. Undoubtedly, the newly formed Council on Dental Therapeutics created by the American Dental Association will, in due time, investigate and report on the formulas of Professor Davis that are sold under proprietary names. Meanwhile, the entire arrangement constitutes an unusual scheme in its relationship to the practice of either scientific medicine or dentistry. (Jour. A. M. A., April 12, 1930, p. 1163.)

INCIDENCE OF BOVINE TUBERCULOSIS IN HUMANS, AND REPORT OF THE OFFICIAL CONTROL AND ELIMINATION OF BOVINE TUBERCULOSIS IN MINNESOTA*

CHARLES E. COTTON
Secretary and Executive Officer, Minnesota State Live Stock Sanitary Board
Minneapolis

WHEN I received the invitation to present this paper, I replied that I did not think it proper for a veterinarian, engaged in administrative control work, to present a paper or make any statements to the medical profession relative to the types of tuberculosis in the human family. Your program committee was persistent, and I agreed to include a review of the evidence of the authorities and laboratory workers on this subject.

The State Live Stock Sanitary Board, since its origin in 1903, has extended service in the control and elimination of tuberculosis in cattle to cattle owners supplying milk to the cities and villages throughout the State, and also to any herd owners who are willing to coöperate with the Board and who would agree to slaughter their reacting or diseased cattle. The city of Minneapolis was the first city in the United States to adopt the ordinance requiring that raw milk should be derived from cattle that have passed satisfactory tuberculin tests. Minnesota was the first state in the Union to adopt the plan of accrediting herds of cattle as free from tuberculosis, and the plan adopted by Minnesota was later adopted as the cooperative plan by the Federal Bureau of Animal Industry with all the states in the Union.

In 1923 Minnesota, coöperating with the Federal Government, adopted the Area Plan for the control and elimination of the disease from cattle, by counties. This work has progressed very rapidly but we are constantly met with opposition instigated by the American Medical Liberty League, which, as you know, has large sums of money available for distribution of propaganda in order to influence legislation against every movement of modern preventive medicine. They quote statements of so-called physicians, and also extracts of articles of recognized scientists, of unproven or impractical theories. We frequently have statements circulated which are claimed to have originated from reputable physicians, quoting Doctor Robert Koch, and many of these statements claim that Koch never changed his views or modified them, up to the time of his death.

In 1901 Doctor Koch stated before the London Congress on Tuberculosis that the germs obtained from human sources were not the same as those obtained from cattle, and there was practically no danger of man contracting tuberculosis from cattle, or about as much danger to man as there was from the inheritance of the disease, which, of course, means nothing at all. He stated he did not deem it advisable to take measures against the spread of the disease from cattle to human beings. Koch's views were immediately studied by many scientific investigators throughout the world. The German Government authorized an investigation and the British Government appointed a Royal Commission. Pennsylvania, the New York City Health Department and the United States Bureau of Animal Industry also carried on investigations. The evidence disclosed by these investigators completely disproved Koch's opinion relative to the transmission of bovine tuberculosis to man and, as a result, Koch later changed his views; but he never fully accepted the results of the other investigators.

At the Sixth International Congress on Tuberculosis in Washington in 1908, when Doctor Koch was met with almost unanimous contrary opinions from other scientists, he opened the discussion on "The Relation of Bovine and Human Tuberculosis,"[1] by saying: "Human beings may be infected by the bovine tubercle bacillus, but serious diseases from this cause occur very rarely and preventive measures against tuberculosis should therefore be directed primarily against the propagation of human tubercle bacilli." He referred

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to possible errors in the research work of others and stated that "The experiments of the British Commission failed in several respects, and all other work which has come to my notice answers these requirements so poorly that I can grant them no weight, at least as regards the occurrence of bovine tuberculosis in man." Among the speakers who contradicted Koch's opinions and defended their methods of investigation were Professor G. Sims Woodhead of Cambridge, England; Johannes Fibiger of Copenhagen; M. P. Ravanel of Madison, Wisconsin; Professor Charles W. Duval of Tulane University, New Orleans; and Doctor Charles F. Dawson of Newark, Delaware. Doctor Koch afterwards declared he had never denied that bovine tuberculosis is found in man, and tried to limit the discussion to the consideration of bovine tuberculosis in the lungs of human beings. He asked whether any cases of pulmonary tuberculosis existed in which bacilli of the bovine type of tuberculosis were found. When Professor S. Arloing of Lyons, France, Professor G. Sims Woodhead of Cambridge, England, and Professor Fibiger of Copenhagen mentioned such cases Koch again[2] questioned the accuracy of their investigations and reports, and finally concluded by saying, "I admit that bovine infection can occasionally occur, and I desire not to be understood as disregarding the endeavors to extirpate bovine tuberculosis, as far as these endeavors are dictated by agricultural and economic reasons; but I mean it would be wrong to give to these proposals the leading place in front of the efforts to combat human tuberculosis."

Koch's opinion as to the transmissibility of bovine tuberculosis to man was conclusively disproved by the final report of the British Royal Commission, presented after nine years of study and investigation.[3]

This report was practically duplicated by research men in Germany, France, Denmark and the United States, and under ordinary circumstances we would conclude that the question of the menace of bovine tuberculosis to man had been settled twenty years ago. However, a few followers of Koch have continued to support his opinions and, as a result, some laymen make exaggerated statements supporting Koch's ideas. From data, statistics and reports, a conservative estimate of the incidence of bovine tuberculosis in human beings is twenty-five per cent of the cases of tuberculosis in children and five per cent of all types of tuberculosis in man.

The World War interrupted the research work on this subject but since then the majority of the reports have come from investigations in Great Britain. Doctor A. Stanley Griffith summarized the data on this subject before the National Milk Conference in London in 1922.[4] He reported the study of types of bacillus of tuberculosis in 1,215 cases in England and Scotland; of the total number, 935 or seventy-seven per cent, were of human origin, and 280, or twenty-three per cent, were of bovine origin. He showed tables of the different types of tuberculosis in man, which disclosed that of 116 cases of tuberculosis of the cervical glands, 46.5 per cent were of the bovine type; that of 476 cases of tuberculosis of the bones and joints, in England and Wales, 18.3 per cent were of the bovine type; and of 28 cases in Scotland 28.6 per cent were of the bovine type; of 126 cases of lupus, 50.8 per cent were of the bovine type; of 52 cases of scrofulodermia, 38.4 per cent were of the bovine type; of 17 cases of tuberculosis of the genito-urinary tract, 17.6 per cent were of the bovine type; of 12 cases of tuberculosis of the meninges, 16.6 per cent were of the bovine type; of 229 cases of the lungs, 1.31 per cent were of the bovine type. He also reported an autopsy of children, of which 113 were classed as local government board series; twenty of these, or 17.7 per cent, were of the bovine type. Also, an autopsy of 46 children of the Royal Commission series, of which 19, or 41.3 per cent, were of the bovine type. Griffith concluded: "That bovine tuberculosis is an important source of human tuberculosis in Great Britain." The bovine tubercle bacillus shares in the production of all of the chief clinical varieties of human tuberculosis and causes an appreciable loss of life, especially in children. The proportion of bovine to human infections is highest in children under five years of age and in those forms of tuberculosis which are primary in the alimentary tract. The age incidence and the anatomical distribution of the primary lesions clearly point to cow's milk as the source of the infection with bovine bacilli and it ought

not therefore to be used for human consumption. Stringent measures should be taken to prevent the sale of such milk. He further states it is estimated by Cobbett, his associate, that the "bovine type of bacillus causes 6.41 per cent of the total deaths from tuberculosis of all kinds in England and Wales, or approximately 3,000 deaths every year."

The percentage of bovine infection in pulmonary tuberculosis in man (1.3) is much higher in England and Wales than in other countries, from reports which have been made.

Doctor Griffith presented a paper[5] at the Eleventh National Conference on Maternity and Infant Welfare in London on July 5, 1929, dealing with 541 cases of tuberculosis of the bones and joints. Of the patients, of all ages, 18.7 per cent disclosed the bacilli of the bovine type. Children under five years of age (102 cases) disclosed the bovine type in 30 per cent, and children under ten years of age (327 cases) disclosed the bovine type in 25 per cent.

In the official journal of the Pathological Society of Great Britain and Ireland, Griffith[6] reports the results of the work done by his colleagues on the Tuberculosis Commission, and himself, on types of tubercle bacilli and other varieties of human tuberculosis.

Table I gives the percentages of human and bovine tubercle bacilli found in the investigation of human tuberculosis:

TABLE I

ENGLISH STATISTICS

Form of Tuberculosis	Number of Cases	0-4 Years H.	0-4 Years B.	0-4 Years B%	5-14 Years H.	5-14 Years B.	5-14 Years B%	14 Years and over H.	14 Years and over B.	14 Years and over B%	Percentage Bovine All Ages
Cervical Gland	116	3	18	85.7	28	26	48.1	32	9	21.9	45.7
Bone and Joint	511	60	24	28.6	277	65	19.0	81	4	4.7	18.2
Urogenital	23	0	0	0	2	1	33.3	17	3	13.0	17.4
Meningeal	33	2	1	33.3	13	7	35.0	9	1	10.0	27.3
Autopsies	1843	72	29	29.7*	48	7	14.3†	21	1	12.5‡	22.3
Miscellaneous	23	2	1	33.3	10	1	9.1	9	0	0	8.7
SCOTCH STATISTICS											
Cervical Gland	17	1	3	75.0	3	7	70.0	1	2	66.6	70.6
Bone and Joint	30	12	6	33.3	8	2	25.0	2	0	0	26.6

*Including one of the two mixed viruses.
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Griffith further stated: "The results of the bacteriological examination of post mortem material have shown that when the primary lesions are in the thorax the infection is of human origin in about 99 per cent of the cases. When, on the other hand, the primary lesions are in the mesenteric glands, only 15 per cent are 'human.'"

Some contended that tubercle bacilli are not found in the milk unless there are lesions in the udder and that only cows with such lesions should be excluded from the milk supply. The reports of the British Royal Commission,[7] Rabinowitch and Kempnes,[8] and Mohler,[8] Chief of the Federal Bureau of Animal Industry, in his review of the evidence which had been accumulated on this subject, are conclusive that the bacilli are at times present in the milk of tuberculous cows presenting no evidence whatever of diseases of the udder, even on postmortem examination.

Klein in "Principles and Practice of Milk Hygiene," states, "Anderson examined 233 samples of milk in Washington in 1906 and found tubercle bacilli in 6.72 per cent. In Philadelphia in 1908, Campbell examined 130 samples of raw milk and found tubercle bacilli in 13.8 per cent; 12 samples of milk sold as 'pasteurized' were also examined by him and one sample, or 8.3 per cent, contained virulent tubercle bacilli. Hess found tubercle bacilli in 16 per cent of the samples he examined in New York in 1909, and of 144 samples examined by Tonney of Chicago in 1910, 10.5 per cent were infected with tubercle bacilli."

When Doctor Bundeson, the Commissioner of Health of the City of Chicago, was making his fight for "Milk from healthy cattle," he obtained the services of Doctor Archibald of our Minnesota State Board of Health, to make a survey of the commercially pasteurized milk. Archibald found tubercle bacilli in 16 per cent of the samples.

Doctor L. Van Es of the University of Nebraska has been making extensive investigations for a number of years of the types of the tubercle bacilli in tuberculous material from man and the different species of animals, obtained from all parts of the United States. For the past six years he has made special investigations of the incidence of avian tuberculosis from specimens obtained from swine and cattle slaughtered at public abattoirs throughout the United States where the Federal Government maintains inspection. He has furnished me with the tentative results obtained by him prior to December 1, 1929, of the host relations of the three types of tubercle bacilli, namely, bovine, human and avian. He is not ready to publish the results of his work, but, without doubt, they will be published some time this year.

He reports the examination of 393 specimens of human lesions other than pulmonary lesions, of which 11 were of the bovine type, 217 the human type and 165 were negative. He was unable to find bacilli of the avian type in any of the 393 cases. He also reports examining and typing specimens of three cases of Hodgkin's disease of the human family, all of which were negative. He examined 164 isolated lesions obtained from the cow, most of which were lymph nodes, of which 100 disclosed the mammalian type of bacilli, 11 were of the avian type, 4 were mixed and 49 were negative; 40 cases of skin tuberculosis in the cow were all negative as he could not find any living bacilli; 5 lesions of the bovine uterus all typed negative; 58 cases of generalized tuberculosis were of the bovine type. He examined 258 isolated lesions obtained from the hog, the majority of which were lymph nodes, of which 12 were of the mammalian type, 199 avian, 14 mixed and 33 negative. One case of pulmonary tuberculosis in the sheep which was of the bovine type. Two cases of tuberculosis in the horse which were of the bovine type. Six cases in the monkey, of which 3 were of the bovine type, one of the human type and 2 were negative. Lesions obtained from two cases of tuberculosis in the fox, of which one was bovine and one negative. In chickens and pigeons 110 cases, of which 104 were the avian type, one mixed and 5 negative.

You will note that of the 393 specimens obtained from man, of lesions other than pulmonary, he was unable to disclose a single case of the avian type. He has summarized his work, tentatively, and concludes that in tuberculosis in man, other than pulmonary, the bovine type is of moderate or conditional virulence, the avian of very slight, if any, virulence, but his data are insufficient for a definite conclusion, as the typing of some of the specimens gave atypical results. In the cow the human type of tuberculosis is avirulent and the avian type is of very slight virulence and is local and non-progressive. In swine the bovine type is of full virulence, extensive and progressive; the human type of slight virulence, local and non-progressive; the avian type of moderate or conditional virulence, local and with a tendency to generalization. Tuberculosis in dogs, both the bovine and human types, are of moderate or conditional virulence and he has found no cases of the avian type in this animal.

Doctor Charles H. Mayo of Rochester,[10] in a paper presented before the American Veterinary Medical Association in August of 1928, stated that "In Minnesota from 1910 to 1925, inclusive, 34,570 persons died of tuberculosis, all but 6,343 of tuberculosis of the lungs. On five per cent of the total basis, this would mean that 108 persons died every year of bovine tuberculosis. It has been estimated that .5 per cent of the cases of tuberculosis of the lungs and 10 per cent of other forms of tuberculosis are caused by the bacillus from cattle. On this basis, 48 persons died every year of bovine tuberculosis. If we accept this lowest estimate of 48 annual deaths, in addition to the hundreds of cases of bovine infection which result in crippling and incapacitating the victims for a long period or the rest of their lives, I am sure we are justified in all our efforts to eradicate bovine tuberculosis."

One could continue to quote statistics from recognized authorities indefinitely. There is not a single recognized authority who doubts the transmission of bovine tuberculosis to man, but there still remain a few physicians who minimize the danger, even to the extent of opposing the efforts to eradicate the disease from cattle, claiming it is so slight that it is not a public health problem.

At the present time 163 cities and villages in Minnesota have milk ordinances requiring

that all cattle from which raw milk is derived for human consumption must pass satisfactory tuberculin tests approved by the State Live Stock Sanitary Board. The United States Public Health Service recommends that all cities adopt a model ordinance they have prepared, which requires that all milk shall be derived from cattle that have passed satisfactory tuberculin tests, and also be pasteurized for the purpose of eliminating the possible bovine infection and other milk-borne infections. There is no question but that all medical men engaged in the control of, or who are responsible for, communicable diseases in the human family, are agreed that milk from cattle untested for tuberculosis and not supervised as to sanitary practice, should be pasteurized.

In the European countries, except Denmark and in the British Islands, no official control measures of bovine tuberculosis have been made and, as a result, the disease has increased. The percentage of tuberculosis in cattle in the British Isles, according to authorities, is 40 per cent, and it is higher in France.

The Sanitary Authorities in Great Britain are now divided in their opinions relative to the control and elimination of the disease. Some insist that they should adopt the plan of this country and tuberculin test all cattle and slaughter the infected ones; there is another faction that condemns this procedure, claiming it would result in a milk famine and would not be economical.

Doctor Charles McNeil,[11] lecturer in diseases of children, Royal Edinburgh Hospital for Sick Children, states in the British Medical Journal of October 12, 1929: "The widespread existence of tuberculous milk constitutes the greatest and most serious example of food poisoning in this country, and gives Great Britain a 'bad eminence' in this matter over almost every other great state in the Old and New Worlds. There is no general agreed policy, either national, municipal, or private, to meet this danger. Until all of our dairy cattle are free of tubercle there are two ways of dealing with the situation, either that the public health authorities require and supervise the pasteurization of all milk supplies for young children, with the exception of certified milk, or that the medical profession unanimously recommend the boiling in the home of all milk for children."

The most ardent supporters of pasteurization are forced to admit its limitation; in practice it can be applied to only the larger cities. This leaves a large majority of the entire population without a practical means of its application. The only solution offered by the advocates of pasteurization, where it can not be practiced, is to boil the milk.

In the light of experiments in animal nutrition, and the recent experiments in the growth of children, raw milk stands supreme, pasteurized milk second and boiled milk a poor third. It is apparent from these experiments that pasteurization destroys the nutritive balance, and as the higher temperatures are applied the unbalancing is more pronounced.

Thirty-five years ago Doctor Bang of Denmark initiated a plan of control of the disease, providing for the tuberculin testing of all cattle, isolating reactors from the non-reactors on the same farm and the pasteurization of the milk and all milk products. The calves from infected mothers are immediately removed to nurse healthy mothers, or are fed on pasteurized milk. This plan has since been known as the Bang System. Owing to the high percentage of infection in Denmark at the time this system was inaugurated, the claim was made that it was the most practical and economical system to control the disease in cattle. The results as disclosed are certainly conclusive that their system is impractical for the reason that there is as high a percentage of tuberculosis in that country at the present time as there was thirty-five years ago. The reason for this, as I understand it, is the fact that it is an intensive dairy country and the farmers, to a large extent, depend upon the dairy cow for at least a part of their incomes, and they are not so financially situated that they can carry out—nor do they properly carry out—the Bang principles.

In this country thirty-five years ago we started out on the fundamental fact that we must stop the perpetuation of the bovine organism through cattle by slaughtering the reactors. This was accomplished by the tuberculin test and the condemnation of any animals revealing clinical tuberculosis. We have found that tuberculin from the time it was first

used up to the present day has been consistent in its action. This has led to the discovery of many interesting facts in connection with the behavior of the organism.

In 1918 it was the general belief that the only source of infection in the hog was the bovine organism. It was believed, if counties were tested and cattle tuberculosis eliminated, that hog tuberculosis would automatically cease. However, the result was that the condemnation of carcasses of hogs slaughtered under inspection was reduced to practically nil, while the retentions of the carcasses for tuberculosis were only slightly reduced. This was called to the attention of the research workers and it was soon discovered that the hog was not only the host of the bovine type of tubercle bacilli, but of the avian as well. In fact, retentions in hogs at government packing houses are upwards of 80 per cent avian tuberculosis. There is no extensive invasion of the avian type in hogs and no condemnation of carcasses results. Hogs infected with the bovine bacilli react only to the mammalian tuberculin and those infected with the avian type react only to the avian tuberculin. Cattle are resistent to the avian type, as laboratory experiments show that it requires a heavy inoculation of avian tuberculosis material to cause a reaction to avian tuberculin, and the period of sensitization disappears within sixty days.

Tuberculin is consistent in detecting tuberculosis. It reveals the disease before macroscopic lesions develop.

In 1918 the Federal Government, through the Bureau of Animal Industry, initiated a plan for the eradication of tuberculosis by cooperating with the Live Stock Sanitary authorities of the various states. Minnesota was the first state in the Union to sign the agreement with the Federal Government. From 1918 to 1923 this coöperative work was limited to the control and elimination of tuberculosis under the Individual Accredited Tuberculosis-Free Herd Plan, and in 1923 the Legislature passed a law providing for the control and elimination of the disease, by counties, under the Area Plan. This law provides that when fifty-one per cent of the cattle owners sign the petition the Board of County Commissioners, at their discretion, may enter into an agreement with the Sanitary Board, and further provides that the county shall make an appropriation to assist in the cost of the payment of the necessary tuberculin tests until the county is accredited. The State and Federal Government pay indemnity to the cattle owners for cattle that are condemned and slaughtered. Uniform Rules and Regulations for the elimination of tuberculosis under the Area Plan have been adopted by the Federal Bureau of Animal Industry and the Live Stock Sanitary authorities of every state in the Union. These Rules provide that if the complete test of all the cattle in the county discloses a percentage of one per cent or more, a second complete test of all the cattle shall be made a year thereafter; or if any complete test of all the cattle discloses a percentage of one per cent or more, then another complete test shall be made one year thereafter. If the test discloses a percentage of less than one per cent, the infected herds shall be retested until the percentage of infection in the entire county is reduced to .5 of 1 per cent or less, when the county will be officially designated as an accredited tuberculosis-free area for a period of three years. When any test discloses a percentage of less than one per cent, a quarantine of the infected herds is established in order to prevent the owners selling cattle to be added to herds that have passed complete negative tests. We continue to retest all herds in which infection is disclosed, each 120 days until every herd in the county has passed a complete negative test.

Our State law provides that the county's appropriation shall be used to assist in the cost of the payment of the expense of the testing until the county is accredited. After a county is accredited the state shall make all the necessary tests to eliminate the infection from the remaining infected herds, and also make the necessary retests after the three year period of accreditation has elapsed, all without expense to the county.

Of the eighty-seven counties in the State, fifty-four have taken advantage of the State law and have applied to the Sanitary Board for the control of tuberculosis under the Area Plan. Forty-three of these counties are officially accredited. We have six more counties in which at least one complete test of all the cattle has been made; five counties are on the waiting list. We have eleven counties in which the majority of the cat-

tle owners have signed petitions to the County Boards, but the County Boards have refused to recognize such petitions, apply for the test and enter into the agreement with the Sanitary Board. Some of the counties failed to take advantage of the law because of financial reasons, and we are informed that the majority of them were influenced by propaganda that is being circulated by the American Medical Liberty League. Petty politics within the Boards of County Commissioners has also been a deciding factor.

The highest percentage of infection disclosed in any county on the first complete test of all the cattle was 5.4 per cent and the lowest percentage was in Cook County, in which the cattle population was only 565; no reactors nor tuberculous cattle were disclosed.

The counties of Carlton, St. Louis, Lake and Itasca disclosed a percentage of less than .5 per cent on the first complete test. The counties of Red Lake, Marshall, Kittson, Norman, Isanti and Kanabec disclosed a percentage of less than 1 per cent and more than .5 per cent. All of the other accredited counties disclosed a percentage of one per cent or more and we were compelled to make a second complete test and also two retests of the infected herds. By so doing we were able to reduce the percentage so that the second complete test resulted in disclosing a percentage less than 1 per cent.

Time will not permit me to furnish the data of the tests of the individual counties. All of the counties in the immediate vicinity of the Twin Cities are now officially accredited; however, we have a few infected herds in each county which are under quarantine, which we will continue to retest until all of them have passed a negative test.

Hennepin County shows a fair average of the status of the counties in southern Minnesota and for this reason I am furnishing the data of all the tests in this county.

The first complete test was made in September of 1928, which test disclosed 3,753 herds containing 37,933 cattle, of which 1,434, or a percentage of 3.7 per cent, reacted to the test and were officially condemned and slaughtered. In this test we did not include accredited herds that were not due for the test.

There were 507 herds, or a percentage of 13.5 per cent, in which reacting cattle or those giving suspicious reactions were disclosed.

In December of 1928 we retested 517 infected herds containing 8,366 cattle, of which 162 or a percentage of 1.93 reacted. There were 113 herds in which reactors or animals giving suspicious reactions were disclosed.

In April of 1929 we retested 131 infected herds containing 3,016 cattle, of which 48 reacted, or 1.55 per cent. There were 21 herds in which reactors were disclosed.

In September of 1929 we made the second complete test of all the cattle in the county and tested 3,711 herds containing 40,752 cattle, of which 146 reacted, or a percentage of 0.35 per cent, and the county was officially accredited for a period of three years. There were 121 herds in which reactors were disclosed.

In December of 1929 the infected herds were retested and the cattle in all but 22 herds passed a satisfactory test. The remaining 22 herds will be retested in April and all infected herds will be subjected to a retest each 120 days until they have passed satisfactory tests.

We have nine counties in the State whose three year period of accreditation has elapsed and in which we have made a complete test of all the cattle. In four of these counties the percentage of infection disclosed on the test after the three year period of accreditation elapsed was less than .5 per cent and in five of them it was under the 1 per cent. We therefore officially reaccredited the four counties after the complete test was made and the other five counties after making a retest of the few infected herds.

Table II shows the percentage of infection in the nine reaccredited counties on the initial test for the first accreditation and the percentage disclosed three years after they were accredited:

TABLE II

	Percentage Initial Test for Accreditation	Percentage Reaccreditation Test
Freeborn	5.40	0.29
McLeod	4.94	0.24
Scott	2.61	0.32
Traverse	3.44	0.46
Wilkin	3.59	0.55
Faribault	3.11	0.98
Meeker	3.58	0.78
Murray	4.31	0.68
Red Lake	0.988	0.65

The percentage of infection after the three years did not have any connection with the ex-

tent of the disease disclosed on the first test of all the cattle in the county, but on the location of the county and the observance of the quarantine provision relative to importation of cattle. The last five counties were surrounded by non-tested counties.

The result of the retest of the cattle in these nine accredited counties is certainly conclusive and shows that the work is practical, permanent, and the public expense justified. To my mind, it is also a complete answer to all the propaganda and the false statements that are being circulated throughout the State and the country condemning the work. Without doubt, since we have succeeded in building up larger accredited areas, the danger of the infection being reintroduced into these accredited areas will be practically nil and will certainly reduce the incidence of tuberculosis in the human family in these areas.

Every state adjacent to Minnesota, and in fact throughout the United States, is coöperating with the Federal Government in eradicating bovine tuberculosis under the Area Plan of Control.

The counties in Minnesota that are accredited and those in the process of accreditation represent the territory in which sixty-one per cent of the cattle population of the State exists and also the territory in which the highest percentage of tuberculosis was known to exist. We are well over the top and the future expense for the eradication of tuberculosis from all the cattle in Minnesota will continue to be less each year. Any funds expended in the control of the disease after the State is accredited will simply be good sound insurance.

The States of North Carolina and Maine are officially accredited. Indiana and Michigan expect to be accredited within the next few months. The cattle in all but one of the counties in Wisconsin have been tested at least once under the Area Plan. The States of Iowa, Illinois and Indiana have recently passed legislation making the test of all the cattle throughout the State compulsory under the Area Plan of eradication.

During the fiscal year terminating June 30, 1928, we tested over 1,400,000 cattle in the State of Minnesota. During the fiscal year terminating June 30, 1929, we tested 1,325,629 cattle. Of this number 1,139,845 were tested in our official coöperative work with the Federal Government. The remainder were tested by practicing veterinarians under the supervision of the State Live Stock Sanitary Board. These figures do not represent the number of individual cattle tested as we retest all cattle in herds in which reactors are disclosed, each 120 days. Therefore, this total number includes cattle that have been subjected to one or more tests during the year.

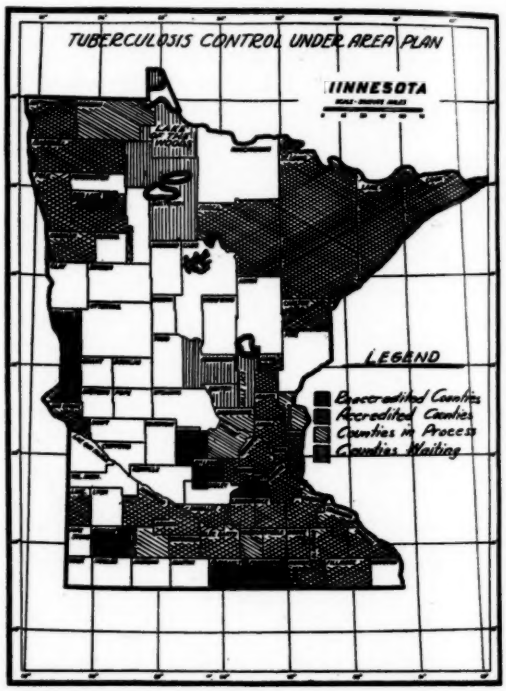

Table III shows the counties that are accredited, the counties that have been reaccredited after the first three year period of accreditation has elapsed, the counties that are in the process of accreditation and in which at least one complete test has been made, and the counties in which the Boards of County Commissioners have furnished agreements to the Live Stock Sanitary Board and which are on our waiting list to be tested.

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ACTION OF PHENOLPHTHALEIN

One should always think of the possibility of a phenolphthalein eruption when studying the etiology of a puzzling exanthem. As phenolphthalein is chiefly excreted into the intestine by means of the bile, and reabsorbed from the colon, there is a tendency for its action to continue for several days. Hence, its continued daily use may lead to ultimate overaction with diarrhea, abdominal pains, tenesmus and bleeding. (Jour. A. M. A., April 12, 1930, p. 1165.)

VAN ARD SANATORIUM

The Van Ard Sanatorium, Inc., does a quack rheumatism-cure business from an old brick residence on the South Side of Chicago. It is an Illinois corporation with an authorized capital of $10,000. Its officers are listed as J. B. Creevy, President; H. L. Cassel, Secretary. They are the same individuals who are, or were, connected with the "Cass Treatment for Rheumatism." The impression is given in the Van Ard advertising that Charles J. Cahill, who is connected with the business of the firm, has special knowledge of the treatment of rheumatism. Needless to say, Cahill's name is unknown to scientific medicine. Just as in the Cass Laboratories fake the letters were signed "Harvey L. Cass" (a person who didn't exist), so in the Van Ard Sanatorium quackery most of the letters are signed "J. B. Crenon, Secretary." And just as "Harvey L. Cass" was really Harvey L. Cassel, so, doubtless, "J. B. Crenon" is Joseph B. Creevy! Reports were received from California of three deaths in which the principal autopsy finding was an extreme degree of atrophy of the liver. The reports brought out that two of the women had been taking the Van Ard "treatment," while the third had been taking the Cass "treatment." From the results of chemical analyses carried out in the A. M. A. Chemical Laboratory it may be stated that the Van Ard treatment consists essentially of acetylsalicylic acid (aspirin), cinchophen, sodium bicarbonate (baking soda) and a laxative. It is obvious that the Van Ard and Cass "treatments" are for all practical purposes identical. In the Cass treatment it was epsom salt, flavored, while in the Van Ard treatment it seems to be phenolphthalein and aloes. (Jour. A. M. A., April 19, 1930, p. 1255.)

"S. C. A." SOLUBLE ANTIGEN, "S. C. A." SERUM EQUINE (CONCENTRATED), AND "S. C. A." SERUM BOVINE (UNCONCENTRATED).

The Council on Pharmacy and Chemistry issues a preliminary report reviewing the available evidence published by J. C. Small concerning preparations stated to represent products obtained from the bacterium claimed to be the cause of rheumatic fever. Preparations of this organism were presented to the Council by the H. K. Mulford Co. as S. C. A. Soluble Antigen, S. C. A. Serum Equine (Concentrated) and S. C. A. Serum Bovine (Unconcenrated). The Council decided that the published work of Small does not offer sufficient evidence to warrant the acceptance of the Mulford products. Further doubt has been cast on the value of this therapy by the paper of Dr. May G. Wilson, in which it is reported that the administration of *Streptococcus cardioarthritidis* antiserum and of the soluble antigen of *Streptococcus cardioarthritidis* did not seem to influence the usual clinical course of the disease or prevent the occurrence of relapses. The Council holds that, while the products are suitable for controlled clinical investigation by experimental workers, propaganda which invites their general use is not warranted at this time. (Jour. A. M. A., April 26, 1930, p. 1303.)

ANTIUSTIO NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Antiustio is claimed by the manufacturer, Frederick Laboratory, Toledo, Ohio, to be "The Greatest Burn Remedy in Existence." A circular contains the following indefinite and non-quantitative statement of composition: "FORMULA Solvent Solution of Plumbic MATERIALS Subnitrate of Bismuth Zinc Sulphate and Iodide of Lead combined with mineral waxes." From this and other statements it would appear that Antiustio is a petrolatum-paraffin mixture claimed to contain 5 per cent of bismuth subnitrate along with small but undeclared amounts of zinc sulphate and lead iodide. The Council found Antiustio unacceptable for New and Non-official Remedies because it is an unscientific preparation marketed with an inadequate statement of composition, under a name which is not descriptive of its composition and with claims that are exaggerated and unwarranted. (Jour. A. M. A., November 16, 1929, p. 1559.)

THE PRE-OPERATIVE CARE OF PATIENTS FOR PROSTATECTOMY*

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IN any field of surgery it is our obvious duty to hold the mortality to the lowest possible point. The great discrepancy of the mortality rates in different institutions evidences the fact that in dealing with the enlarged, obstructing prostate some factor besides the surgical technic, *per se*, must be considered as the cause. It has been shown in many clinics that an exact understanding of the abnormal physiology present in these patients and the application of steps to return their functions to as nearly normal as possible, before any operative intervention takes place, will usually lower the mortality to as low as 2 to 5 per cent. In other institutions the mortality is still 25 to 30 per cent because the significance of careful preparation is not understood or, if understood, is not practiced.

In prostatic surgery we are usually dealing with poor primary risks, old men with lowered vitality, 80 per cent with cardiovascular pathology, 50 per cent with pulmonary disease and few with a normal renal function.

Benign hypertrophy of the prostate with obstruction is not unlike any other obstruction, whether it be biliary, gastric or intestinal, with its resultant toxemia. This may be an increased retention of nitrogenous products due either to the breakdown of body protein or a failure of excretion, or other alterations of normal balance in blood constituents, fluid balance, chlorides, carbon dioxide combining power or acid base equilibrium.

After taking a careful history, a complete and thorough physical examination should be made in search of coincidental diseases and, if found, these should be treated appropriately. The urological examination is important and should include an especially careful search for evidence of infection of the kidneys, bladder, prostate, seminal vesicles and epididymes. The immediate laboratory examinations to be made should include blood Wassermann, coagulation time and typing, as well as the usual routine examination. A careful search of the urine should be made for evidences of infection, and if present these should be localized. Blood chemistry should be estimated every three or four days throughout the preliminary management, as it gives direct evidence of the progress the patient is making and aids in determining when the maximum kidney function is reached. Urea nitrogen and creatinin content are the most important, but blood sugar determination should also be made, as by so doing one will occasionally avoid the embarrassment of operating upon a patient in the hyperglycemic state.

If the bladder is palpated or shown by percussion to be above the symphysis pubis, care should be taken not to empty it too rapidly, as these cases with high grade retention frequently develop a suppression of urine if the back pressure is too suddenly released. Decompression may be done by intermittent catheterization, replacing about two-thirds of the amount of urine removed with boric acid or some other antiseptic solution. I feel that frequent catheterization more commonly leads to infections than does a correctly managed inlying catheter. Shaw and Young have devised a very ingenious decompression apparatus, which can be used by the patient in bed or in a wheel chair, and this aids greatly in keeping these patients exercising and thus does not alter the normal habits to any great degree. A decompression can, however, be done very satisfactorily without this apparatus and I feel it should be done in every case that shows a residual above 150 c.c. The following is a satisfactory method: After having the patient void, an inlying catheter is inserted, taking care not to allow the residual urine to escape. The catheter is then attached to a tube leading to a receptacle on a standard at the side of the bed. The end of the tube is raised to the point at which the bladder pressure raises the urine and the level marked, allowing all the

*Read before the St. Louis County Medical Society, Duluth, Minn.

urine which is excreted to flow at this level for the first twenty-four hours. The container is then lowered 5 cm. daily until it reaches a level about 15 cm. above the bladder, after which it may be allowed to drain freely. In cases of more or less acute retention in which the blood chemistry does not show much evidence of kidney damage the drainage level may after a few days be lowered much more rapidly than that stated, though this should not be done in the presence of hypertension or much increase in urea nitrogen or creatinin.

After decompression is completed, a phenolsulphonephthalein functional test should be made and repeated twice weekly in order to watch the progress of recovery of the kidneys. Intravenous administration of the dye is preferable to the intramuscular route because of the fewer sources of error. Employing the intravenous route we are assured that the dye comes into direct contact with the convoluted tubules immediately and there is practically no error in determination of appearance time, which is one of the important parts of this function test.

To avoid complicating infections the daily instillation of various antiseptics into the bladder has given excellent results. Among those commonly used are mercurochrome, silver nitrate, argyrol, oxycyanide of mercury and meroxyl. Of these, meroxyl probably has the most advantages. In strength of 1 to 400 or 500 it is only slightly irritating, actively germicidal and does not have the disadvantage of masking gross blood, or being precipitated by urine, serum, pus, or blood. One ounce of 1 to 400 solution instilled and retained in the bladder for a short time twice daily will not only prevent infection but will aid greatly in clearing up any cystitis which may be present.

Preliminary vasectomy or vasoligation has increased in practice recently and is now being done routinely in numerous clinics. Reports from various clinics show an occurrence of epididymitis in prostatectomy patients varying in frequency from 20 to 80 per cent with a probable average of about 35 per cent. Besides being a painful complication for the patient and a disagreeable one for the surgeon it is also quite an economic complication to the patient. Vasectomy should be done as soon as preparation for the operation is started, preferably before any instrumentation. It is such a minor procedure that it may be done in bed while decompression is going on and without disturbing the patient to any great extent. Rolnick in his experimental work showed that unless at least 1 cm. of the vas is resected there will again be union and unless the sheath surrounding the vas is excised there is considerable danger of epididymitis due to the infection traveling along the lymphatics. Vasoligation does not completely fulfill the above requirements and therefore is not so desirable as a correctly performed vasectomy.

Preliminary cystostomy is necessary in about 25 per cent of the cases. The factors demanding this procedure are: intolerance to the inlying catheter, intercurrent urological infections, psychoses and inability to catheterize the patient. It may also be the method of choice in cases which require prolonged drainage.

The judicious use of fluids, combined with preliminary drainage is without doubt the most important factor in carrying a large percentage of patients through a successful operation. Fluids in sufficiently generous amounts are detoxicating and diuretic, thereby neutralizing and eliminating toxic products, as well as maintaining the normal viscosity of the blood. As soon as drainage is instituted fluids should be forced up to at least 4,000 c.c. daily, and when a uremic or preuremic state exists at may be necessary to give as high as 10,000 to 12,000 c.c. in twenty-four hours. Water may be given in large quantities by mouth but there should be no hesitancy in utilizing the other available routes, *i. e.*, by vein, rectum or hypodermoclysis. The use of 1 per cent sodium chloride solution intravenously, as recommended by Bumpus, is efficient in overcoming the impaired renal function in these patients. It not only increases the blood and tissue fluids but also restores the plasma chlorides to normal. Glucose solutions are advantageous for heat and energy as well as being efficacious in stabilizing the disturbed acid-base equilibrium. It may be given by mouth or rectum but is probably most beneficial when given intravenously in 5 to 10 per cent solutions, whether alone or in combination with 1 per cent saline solution. The chief contraindication to forced fluids is a weakened myocardium and cases so

afflicted should be carefully watched for the first evidence of edema in order that a happy medium may be reached—one beneficial to the kidney without damage to a weakened heart.

By the judicious use of digitalis in valvular and myocardial disease as well as in those with arrythmias, one may, without embarrassment, through its action of increasing the cardiac reserve, eventually get the fluid intake up to 4,000 to 5,000 c.c. daily. Patients with hypertension are also benefited by the use of digitalis and usually go through the operation with less shock than when not digitalized.

It is unwise to operate upon this type of patient too early or before all of the above mentioned preparatory steps are completed. At least ten days of observation, testing and preparation should be made even on men who are apparently in excellent condition. In markedly advanced stages it may require several months of drainage before the functional tests have reached a normal stability and the patient's system is ready to cope with the shock, infections and hemorrhage which may accompany or follow a prostatectomy.

General anesthesia is rarely used today in prostatic surgery. It has been supplanted by the use of novocaine to such an extent that but a small percentage of the prostatectomies are being done with the more dangerous anesthetic. Sacral or epidural anesthesia is satisfactory in 80 to 90 per cent of these cases when combined with adequate infiltration or infiltration block of the abdominal wall. If anesthesia is not complete it can be supplemented most satisfactorily by direct infiltration of the capsule under direct vision.

Spinal anesthesia has much to recommend it in selected cases. Ephedrin has done much to overcome its depressant effect sometimes characterized by an alarming drop in blood pressure. This condition is especially dangerous because it may result in a delayed suppression and consequent uremia.

Neither spinal nor sacral anesthesia has the deleterious effect of general anesthesia upon the pulmonary and cardiovascular systems, which it has been our endeavor to protect throughout the preparation.

In conclusion it may be said that, by careful examination, intelligent understanding of the physiological principles involved, the use of the facilities at our disposal with which to regain a normal physiologic equilibrium, delay rather than haste in operating, and finally, the choice of a safe anesthetic, prostatic surgery will enjoy the position of relative safety it deserves.

410 Fidelity Bldg.

UNDULANT FEVER BACTERIAL VACCINE

The Council on Pharmacy and Chemistry reports that the Jensen-Salsbery Laboratories, Inc., have presented Undulant Fever Bacterial Vaccine (Jensen-Salsbery) for consideration by the Council. This product is stated to be a physiologic saline suspension of *Brucella melitensis* (var. *abortus* 75 per cent, and *suis* 25 per cent). From an examination of the published reports the Council's referee came to the conclusion that this material does not offer adequate evidence for the usefulness of the product and that this form of treatment should be subjected to further controlled clinical trial. The Council voted to publish its preliminary report and to postpone definite action on the question of accepting Undulant Fever Bacterial Vaccine (Jensen-Salsberg) while awaiting the development of further evidence of its therapeutic value. (Jour. A. M. A., April 26, 1930, p. 1304.)

SUN CHOLERA MIXTURE

During the cholera excitement in New York in June, 1849, a physician by the name of G. W. Busteed sent a recipe for the disease to the editor of the New York *Sun*. It was printed, and was so successful in the relief, at least, of the symptoms that it came to be popularly known as the Sun Cholera Mixture. It was admitted to the first edition of the National Formulary in 1883 and in subsequent editions under that name. The original formula called for: tincture of opium, tincture of rhubarb, tincture of capsicum, spirit of camphor, essence of peppermint, equal parts. The formula was modified somewhat later on account of the changing strength of some of the ingredients in later editions of the Pharmacopeia. (Jour. A. M. A., April 5, 1930, p. 1088.)

TRACHOMA PROBLEMS AS DEALT WITH AT THE THIRTEENTH INTERNATIONAL CONGRESS OF OPHTHALMOLOGY*

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IN view of the notable presence of trachoma among our Minnesota Indians, the subject of trachoma presents uncommon interest to the medical profession and the general public of the state of Minnesota.

The hygienic and social significance of trachoma was accentuated by the attention given it at the last International Congress of Ophthalmology, held at Amsterdam and the Hague, during its session in September, 1929.

The discussion took the form of a symposium, and was participated in by many of the leading ophthalmologists throughout the world, including Wibaut of Amsterdam, Vefik Bey of Turkey, Nouri Hefmi also of Turkey, Riza Sadi of Syria, Hindawy of Arabia, Chams of Persia, Ticho of Palestine, Miyashita of Japan, Soira of Spain, Da Gama Pinto of Portugal, Petit and Magito of France, Selenkowsky of Russia, Grosz of Hungary, Hanke of Austria, Bakker of Holland, Wright of England, Ferguson of New Zealand, Fallen of Luxembourg, Gronhelm of Sweden, Maggiori of Italy, and Brukner of Czecho-Slovakia, and others. The writer listened to many of these addresses and their discussion, and from these, and the printed material obtained at Amsterdam, he will, to the best of his ability, indicate their general trend and significance. This, however, is not easy, for the subject was dealt with to such an extent, and the different phases presented were so numerous, that to present in synoptic form for a short paper is no easy task.

The subject was presented largely from the following viewpoints: (1) the geographic distribution of trachoma and its frequency in these areas; (2) the different methods carried out to obtain statistics regarding trachoma in the different countries; (3) methods to segregate and to prevent extension. Other phases were brought up and discussed, but those just enumerated constituted the framework for the symposium. Very little regarding treatment was said, and this little, simply restated, present well known and usual practices in the treatment of the disease. These largely concerned questions of prevention of infection, usual local medication, and expression. I did not hear removal of the tarsus recognized as a desirable procedure, and, in fact, several times noticed that this method of treatment was disapproved.

So expansive was the material presented that it will be necessary for me to briefly consider these somewhat in orderly arrangement, and to do this, we will proceed in the following manner:

(A) Methods of obtaining statistics. These were as follows:

1. Official statistics based on compulsory notification.
2. Examination of school children.
3. Examination of recruits.
4. Examination of samples of population more or less representative.
5. The number of trachoma patients in proportion to other eye diseases in ophthalmic clinics.
6. The absolute number of trachoma patients known to oculists or general practitioners.
7. Approximations given by oculists or general practitioners who know the country.
8. Trachoma percentage in the causes of blindness.

We may briefly remark upon these, through the assistance of the World Trachoma Map, as presented by Wibaut of Amsterdam. Regarding the first (compulsory notification), the figures obtained are always much too small. In Syria, the official index is but 3 to 5 in 10,000, whereas, in fact, 59 per cent of all the eye cases occurring in Syria are trachoma. In certain parts of Russia, an index of 534 to 10,000 is given, whereas, the real and correct index is 45 per cent of all eye cases. It is to be noted, however, that through compulsory notification we may discover some

*Read by request before the Minnesota Academy of Ophthalmology and Oto-Laryngology, in January, 1930.
This review of an important symposium and discussion on trachoma was made from notes taken at the time of and literature given out during a visit to Amsterdam in September 1929, when, by invitation, an address was also delivered before the Congress.

relative value for different parts of the same country, or different countries.

As regards the examination of school children, we obtain a very exact series of figures, especially when the school population is not a select one, and the diagnosis is made by an experienced oculist. In some countries, however, this percentage may be much too high where there is a frequent occurrence of follicular conjunctivitis, which may not be, or cannot be, distinguished from trachoma.

As regards recruits, statistics are of distinct value when obtained from a country where conscription exists.

As regards four, the examination of samples of population more or less representative, the figures are generally too high, for there is an inclination on the part of the oculist to seek for cases of trachoma if the disease is not very prevalent. Furthermore, the population may either come when they have eye diseases, or may try to evade examination.

As regards five (the number of trachoma patients in proportion to other eye disease in ophthalmic clinics), this is the oldest method of approximation and the one most used by former writers.

The figures obtained by taking the absolute number of trachoma patients known to oculists will be found much too small, since a large number of such patients are never treated, and when the diagnosis is made by general practitioners, many cases are overlooked.

Attention was called to the fact of the diagnostic difficulties presented. A large number of cases resembling trachoma are not necessarily trachoma, and there is much confusion with follicular forms of disease. It is not easy to estimate the influence of race, but as a rule it was thought that the race differences go hand in hand with the differences of social welfare and education. No race seems to be immune, not even the negro, although this has been disputed. There is undoubtedly a predominance of trachoma in the female. Some reports stress the importance played by the general constitutional condition; and general welfare is a factor that is obvious and generally admitted.

As to the causes of the spreading of trachoma, we may state that the contagiousness of the disease is now generally admitted. This has been proven too often to deny. On the other hand, the degree of this contagiousness differs enormously. Cicatricial and chronic granular cases may be only slightly contagious, while the acute cases may be extremely so. As regards the onset, it has been found, in some deliberate self-infections and in some other known cases, to be about from four to ten days, but as regards the incubation period of the more chronic beginning cases, nothing definite is known. As regards the mode of infection, little is known. By direct observation in many countries, it has been proved that it often takes place in the family.

Miyoshita (Japan) shows quite conclusively that not only are infants often infected but that the trachoma percentage in the schools is at its maximum at seven years of age, proving that most school children must have become infected at an early age at home. The rôle of the mother as the source of infection is not so prevalent as has been contended. Sobhey Bey informs us that in Egypt nearly all trachoma school children take the disease into the school with them, and in Italy Maggiori states that measures are taken to isolate and treat the children before they are of school age. Selenkowsky in Russia, others in Palestine, as well as ophthalmologists in the Baltic countries, state that their experiences were practically the same; that the children were infected before they came to school, and that the younger children are infected mostly by their brothers and sisters. On the other hand it is interesting to note that while very few emphasize the significance of school infection, yet it is a thing we cannot deny, but the rôle played by the school in spreading the disease is not so great as was formerly believed.

As concerns the mode of contamination, this is generally by direct contact, and this danger may be increased through workmen, or others, who enter from countries in which there is much trachoma. Toilet articles in common use may be conductors of the infection, but it was not thought likely that dry objects, such as tools, had much to do with the spread of the infection. In many southern and eastern countries, especially Egypt, it has been a popular conception that flies may carry the disease, but the view was expressed that while this seemed to be true as regards the secondary infections, and not proved as regards trachoma itself, it cannot be denied, especially as concerns the acute cases. As regards the secondary infections, endemics are pos-

sible without them, as has been proven in the Baltic countries and in Russia. It appears that the dryness of a climate, although not a principal factor, plays its part in the spreading of the disease. Traffic has also a rôle, as shown in the increase of the disease at Marseilles, and the general increase during the World War; and the number of cases noticed at crosspoints of traffic in Africa. It was pointed out, however, that the most rigid immigration control will never completely eradicate the disease in a country where it is endemic. Neither would it have much result between two countries which are affected. It has, of course, value for those countries which are little infected. The decrease of trachoma, in high altitudes, may be particularly, or entirely, due to the fact that in these regions there is much less traffic.

As regards the eliminating of trachoma and its prophylaxis, while the situation was regarded as a terrible one, the view was expressed that there is no reason for too pessimistic an outlook. Even between Egypt and Palestine, the most infected countries, the fight against this disease does not seem to have much effect.

We next come to the consideration of measures advocated for the control and eradication of the disease. The control of national frontiers may of course be of great value from the international standpoint, but is only of personal value when it induces the sufferer to submit to treatment. Legal measures demanding compulsory notification have value, if carried out, for the prophylaxis is only of direct use when this leads to treatment. On the other hand, when the fear of notification stops the sufferer from consulting an oculist, it does more harm than good.

As stated, it has become a well-established fact that trachoma patients are, as a rule, already infected in childhood, and it is also pointed out that treatment in the early stages of this disease brings about the best results. Thus, the examination and proper treatment of school children appears to be the best method to combat and prevent the disease. It was pointed out that exclusion from school and segregation in schools and special classes without treatment have not proved efficient measures, in view of the great influences of family as regards the spreading of the disease. The examination and treatment of recruits has also been effective, but here also results are better if the treatment is started at an earlier age. It is unanimously agreed that in the infected countries there is a dire need for more physicians, more oculists, and more hospitals. General hygienic measures, as cleanliness and good housing, are important, but these are only too often beyond the power of the oculist to influence, and the same may also be said regarding the betterment of general welfare. Scientific investigation is important, especially as concerns the micro-biological etiology of trachoma and the diagnosis of incipient forms, and the relation of trachoma to certain forms of conjunctival folliculosis.

The importance of international collaboration was recognized and thought to be absolutely necessary. Every country in which the disease is prevalent and endemic is a source of danger to its neighbors. Frontier controls interfere with communication, and give only relative results. For this reason it is clear that countries free from trachoma should interest themselves in the fight against this terrible disease ravaging their affected neighbors. In this way they may remain free from infection themselves, while at the same time helping those who are suffering. That most of the countries affected are also the poorest, is an outstanding reason in itself for international intervention and help.

To accentuate the terrible grip of trachoma upon the human race, I shall give a few figures strikingly illustrating this. Almost every aspect from which we view the subject of trachoma is important, and that related to its wide distribution is not alone interesting but severely alarming. Except in some sporadic instances, we are not, in our country (America), confronted with the disease to such a degree as to give us a true measure as to the frightful and serious menace it is to the world as a whole. To give some idea of these startling aspects, we will turn to the extensive reports presented at the International Congress. These will show you that the problem is not only a very serious one but one that is truly international. It is important for those nations afflicted to improve the conditions, but it is also quite as important for other nations less affected to have the disease stamped out in the affected areas as a matter of self-protection. It is thought that the number of trachoma patients in proportion to other eye disease in ophthalmic clinics presents a fairly reasonable index as to the amount of the disease in that country

or community. Thus indicating the number of eye cases by the numerator (b) and the population index by the denominator (a), we have a frequency index of b/a. On this basis we find that in the countries in which trachoma is more frequent the disease is found in about one-third of the population, ranging from 4 to 5 per cent, to as high as 80 per cent. In Finland, in 1900, using this index somewhat modified so that the population index is (a) and one-third of the index of trachoma among eye cases is (b), we find there was 15 per cent. In 1928 this had diminished to 4 per cent. The conditions elsewhere are strikingly different. At present, in the Baltic provinces, we find in Esthonia 10 per cent, Lavonia 15 per cent, and in Lithuania 22 per cent. In Cochin China, it is 38 per cent, and in Palestine 16 per cent. In Syria we have the startling index of 80 per cent and almost as great in Lebanon of 76 per cent. In the Argentine we have 41 per cent, in Japan 28 per cent, in Formosa 40 per cent, and in Corea 16 per cent. Surely, these figures are sufficiently alarming to cause us to grasp the world significance of this disease. A general survey presented to the Congress, showed that in Italy the recruits had trachoma in 8.84 per cent, with a maximum in those from Sardinia of 56 per cent. The school statistics showed that this disease is greatly spread among the school children, from 10 to 12 per cent in some places. In some areas a marked diminution has occurred under the influences of measures taken for combating the disease. The disease is more frequent in the great industrial centers and at the large ports; and the immigrants entering play a large part in spreading the disease. The nature of industry is of secondary importance, and there are 80,000 sufferers from trachoma under supervision in Italy. In Tripoli, there is about 25 to 80 per cent of the population affected with this disease. In contrast to this, in Belgium there has been a gradual decrease, so that there is now but from 0.5 to 1 per cent of persons examined who show trachoma. In Rumania, the reports of Malonesco and Panikscu, and others, showed a great increase in trachoma since the war, especially in Transylvania. In the clinic at Bucharest the eye patients treated for this disease have increased from 10 to 20 per cent. The disease is more frequent along the Ukranian frontier and the total number of trachoma cases in Rumania is estimated at about 90,000, of which only 11,000 are under medical treatment. Maiewsky reported that in Poland, in some localities, all of the school children are trachomatous, especially among the Jewish population, and the war did much to spread the disease. Examinations in Warsaw give figures of between 10 per cent and 100 per cent. In Czecho-Slovakia, Bruckner reported that out of 13,000,000 population, 61,000 suffer from this disease.

However, these reports, alarming as they are, do not so deeply impress us as the report of Prof. Selenkowsky of Leningrad, as well as those from Palestine by Ticho; the latter we will consider first. In Palestine there are about 400,000 trachoma patients, 15 per cent of the Jewish population, and 50 per cent among the Arabian. The frequency rapidly increases from the third to the fifth year of life, but remains stationary until the eighth year, and then gradually decreases to the twentieth. Ticho states that the children are already infected before they come to school, and that infection in the school is rare. More boys than girls are affected in the proportion of 4 to 3. More children from the country are affected, than from the towns. In explanation of this apparent paradox, probably the explanation is found in that in the small towns of the country health supervision and the general surroundings are not so good as in the larger towns with more official administration. He states that the temperature has an indirect influence by furthering acute purulent conjunctivitis in the hot months. In 26 per cent of the blind in Palestine the cause is found in trachoma. We will now briefly consider the report of Selenkowsky. Russia is an incomprehensible territory with different geographical features, different populations, with different cultures and methods of living. In European Russia, with a population of 113,000,000, there are known 767,306 cases of trachoma, or 144 for every thousand of the population. In Asiatic Russia, of a population of 11,000,000, there are 124,062 of the population affected, or 90 for every thousand; in the Caucasus 58 in every thousand; in Siberia 45 in every thousand. The industrial circles are affected less, and the borderlands and cities are affected more. Selenkowsky believes that it is not probable that an immunity is present in the adult, and also that there is not a special susceptibility in the child's conjunctiva. The disease does not seem to be racial in its manifestations, but rather it is to be found that the extension is

largely concerned with the immediate or indirect surroundings of individuals. It does not appear as much in favorable localities as in villages situated near swamps and those that have few trees or forests. In final analysis, it seems that the disease is one intimately related to living conditions, both in its origin and its extension. In the upper classes of society—the more cultured—there is comparatively little of this disease, but in the lower classes, living under most unfavorable hygienic conditions, we find it common. This writer believes that trachoma is not extended through the school, but that it usually occurs at home, and from here is brought into the school, and that we must therefore consider it from a standpoint of attack of a childhood disease that must first receive proper attention in the home.

Thus, from an enormous amount of material presented at the Congress, the writer, from notes taken at the time, through the process of his own memory, and by references made to the reports, has attempted to present certain vital aspects of an important world problem. Certainly enough has been presented to indelibly force upon us the menace of trachoma. There can be no doubt that it is as much a world problem, and quite as important as the world fight against tuberculosis, lues, and other infectious and epidemic diseases. Every possible point of entry into our land should be guarded; and, of course, much has been done and is being done now in this regard. Sporadic manifestations of the disease should be treated by intelligent and competent health officers and ophthalmologists. All cases of an individual sporadic nature should be reported and treated immediately and kept under supervision. We must keep in mind that the disease finds its more fertile soil in unclean habits of life and unhygienic surroundings. While we are not generally, or severely, afflicted in the United States, the disease should nevertheless receive the most thorough attention, both from the state, health officers, and ophthalmologists. There is another aspect of the question that concerns international relationship. Not only should we attempt to stamp out the disease entirely from our own country, but we should be willing to help the less favored countries thus afflicted, by all the means we have at our possession. This is not only from the correct humanitarian standpoint, but it is vitally necessary for the protection of both ourselves and our neighbors. As stated, very little was said at the Congress regarding treatment, and probably for the reason that there is a very general agreement upon the different forms of this throughout; proper surroundings, prophylactic measures to prevent its spreading, avoidance of contact in the immediate family and inner circles, and the use of local medication. The writer remembers, while talking with Prof. Fuchs some time ago regarding this disease, that the latter told him that among all the different medicines tried in Vienna, none seemed to be so efficacious as copper sulphate. The writer of this article, while frequently using this in the form of the copper stick, supplements it by a few drops of a 5 per cent solution of copper sulphate in glycerine, dropped into an eye cup half filled with distilled water, in the eyes morning and night, by the patient at his home. Silver may at times be alternated, but ofttimes irritates more than it does good. It seems to be better in its effects in very acute phases, and for the manifest reason that the superficial layers of the conjunctiva are markedly affected by it and are thrown off. Tannic acid in glycerine is also a very efficient drug to alternate with copper sulphate. It is also very important, as in all inflammatory conditions of the conjunctiva with much secretion, that a bland unguent such as petrolatum or alboline be smeared along the palpebral borders before the patient retires. This prevents retention of materials during the night. These therapeutic suggestions are simply from personal experiences of the writer himself, and not reflections from the Congress.

Roche of Marseilles, in a report concerning the clinical studies as to infection in cases of trachoma, states that these lead to two references:

1. For the carrying of trachoma to others, an intermediary (a host) or additional factor, is necessary. The greater or lesser profusion of that coöperating factor would determine the greater or lesser frequency of the infection. This explanation is not very plausible, though it cannot be excluded with certainty in the present state of our knowledge.

2. Trachoma is only infectious during a short period. If this supposition should be confirmed by clinical or experimental examination, this would, as a matter of course, greatly simplify the combating of trachoma. It would be sufficient to isolate the patients during the period of infection in order to prevent all spreading of the affection.

418 Insurance Exchange Bldg.

MALARIA AND ANOPHELINE MOSQUITOES IN MINNESOTA

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IT is very generally believed by medical men, and by others interested in public health, that malaria cannot originate in Minnesota. The idea is not supported by the facts and though the local appearance of the disease is very exceptional the possibility of sporadic cases should be recognized.

During the summer of 1929, Dr. O. McDaniel, of the State Board of Health, called the writer's attention to a case of clear-cut local origin in the practice of Dr. A. E. Meinert of Winona. The patient, a city fireman, had not been out of the state in five years' time and had not been sick before. Blood smears showed heavy infection with benign tertian malaria.

Sanford (1913) reported another case clearly acquired in Minnesota. It was that of a child two years of age, whose residence and birthplace was Oronoco, Olmsted County, and who had never been out of the state. Blood examination revealed a double infection of the tertian parasite, with many typical specimens of *Plasmodium vivax*.

He also reported a typical case of malaria in a woman of 35, who was born in Michigan, had lived for many years in North Dakota and for the three years preceding examination, in Wisconsin. He states that Dr. L. F. Germain had reported before the Milwaukee Medical Society two cases of malaria clearly contracted in Wisconsin during the summer of 1911. Coon and Overton (1923) refer to six imported cases which had been treated in the infirmary of the University of Wisconsin, at Madison. Discussing the possibility of locally acquired infection they cite three cases which had occurred in the practice of other physicians.

Doubtless there are a number of other cases in both Minnesota and Wisconsin which have come to the attention of practitioners and have not been reported. The infection may even be completely unrecognized because of the belief that malaria does not occur in the state.

An instance in point came to the attention of the writer several years ago. Following a tonsillectomy a patient in one of the hospitals of the Twin Cities exhibited a considerable rise in temperature which was the occasion of some concern until he himself suggested that he had malaria, a disease which he had previously suffered from in his southern home. Blood examination showed that this was the cause of the fever, a latent infection which had been stirred up by the operation.

Similarly, students returning to the University after summer vacations spent in the West or in the South occasionally exhibit an acute attack of malaria remote from the source of infection, or summer tourists may suffer a relapse of the disease while camping in Minnesota.

Of course, cases such as those cited above could not give rise to endemic infections in the absence of mosquitoes capable of carrying malaria. The significant fact is that we have in Minnesota two species of Anophelines, both of which are demonstrated transmitters of the disease. *Anopheles punctipennis,* a vector of both tertian and æstivo-autumnal malaria is fairly common in the Twin Cities. I have taken it repeatedly in the buildings of the State University. C. W. Howard, 1916, has had the same experience, and reports for Savage, Minnesota, as well. Evidently this is the same species reported by Taylor, 1910, under the name *Anopheles maculipennis.*

Anopheles quadrimaculatus, the potential carrier of all three types of the disease, has likewise been taken repeatedly at St. Paul and there is in the University collection a specimen labelled Grand Rapids, Minnesota.

According to Sanford, 1913, "In 1903, Dr. H. P. Johnson, then Professor of Bacteriology in St. Louis University, noted the presence of numerous Anopheles mosquitoes in the vicinity of Ely, Minnesota." There is no indication as to species, but in all probability they were of one of the above-mentioned.

With the increasing tourist influx and especially with the establishment of our numerous tourist auto camps, the possibility of infection

of Anopheles mosquitoes is by no means a remote one. According to the report of the "Ten Thousand Lakes Association" it is estimated that more than one million, six hundred thousand tourists visited the state during the summer of 1929. In each of the 381 recorded tourist camps there was an average number of 33.27 persons staying daily. This would give a total daily number of 12,675 staying at these camps scattered over the state. Many of these came from malarious sections of the country and doubtless a significant number are actual carriers of the parasite. The writer several years ago made an examination of a group of twenty young men who had come to Minnesota from Arkansas and found two of them to be malaria carriers.

Moreover, with the increasing use of induced malaria in the treatment of paresis there is an additional very definite possibility of mosquito infection and subsequent transmission. The idea that the organisms from these patients are not capable of developing the parasite cycle in the mosquito is altogether fallacious.

That isolated carrier cases may become foci of local outbreaks has often been established. Craig (1909) points out that, "Local epidemics of malaria are often observed in places which may have been free from infection for many years. An instance of this kind occurred under my observation in a city in Connecticut. Some years before the Spanish-American war this city occasionally reported the presence of tertian malarial fever, but the cases were few in number and no other form of malaria was ever observed. After the return of a company of militia at the close of the war mentioned, several cases of remittent fever were observed which, upon investigation, were found to be infections with the æstivo-autumnal malarial plasmodia. The introduction of this organism was traced to returning soldiers, some of whom had suffered from this form of malaria while in Cuba upon special service. In this instance the conditions necessary for the spread of the disease were all present in the city with the exception of the infected individuals, the right species of Anopheles, warmth and moisture, a susceptible people awaiting only the returning soldier infected with the æstivo-autumnal plasmodium, and thus a form of malaria never before observed in the State of Connecticut became prevalent in this city."

It is significant that early records show that "ague" was commonly present in Minnesota during pioneer days. Making due allowance for imperfect diagnosis, it is obvious that the disease was brought in repeatedly from malarious regions, prevailed for a time and then, since conditions for its continued propagation were unfavorable, it pratically disappeared. These unfavorable conditions were largely climatic, since Minnesota lies about at the northern limits of the distribution of the disease in the United States. This limit, according to Hirsch (cited by Marchiafava and Bignami, 1900), is between the isothermal lines of 15° and 16° C. (59° and 60.8° F.), mean summer temperature. The United States Weather Bureau shows that for twenty years the entire state had a mean summer temperature slightly above 60° F.

The conditions outlined make it certain that sporadic cases of malaria in Minnesota are to be reckoned with. That they will ever be common is quite out of the question. Climatic conditions, the short season, with its relatively small population of anopheline mosquitoes, together with the remote mathematical possibilities of just the right combination to insure transmission, all preclude possibility of more than rare cases.

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CASE REPORTS

CONGENITAL VALVULAR OBSTRUCTION OF THE POSTERIOR URETHRA

REPORT OF A CASE

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The occurrence of abnormal folds or valves in the male posterior urethra causing varying degrees of urinary obstruction is now recognized as a pathological entity. Tolmatschew, in 1870, gave the first complete discussion of the subject, while Eigenbrodt, in 1891, probably discovered the condition for the first time in a living subject, upon whom he was operating for an obscure urinary obstruction.

Knox and Sprunt, in 1912, were the first to report a case in America. Young, in 1913, however, made the first clinical diagnosis of the condition and corrected it surgically with a successful result. Young, Frontz and Baldwin in 1919 collected from the literature twenty-two cases of congenital valves of the posterior urethra. These were cases found at autopsy. In the same article were reported twelve cases seen in the urological and pediatric clinics of the Johns Hopkins Hospital. In eight of the latter cases diagnosis had been made clinically and successful surgical procedures instituted for the removal of the obstruction. The other four cases in this series were not operated on, and died. In 1925 Hinman and Kutzmann, in a comprehensive review of the subject, reported twenty-one additional cases, six of which were observed in their personal practices, thus bringing the total number of cases reported to date of congenital valvular obstruction of the posterior urethra to fifty-six.

Young, Frantz and Baldwin have described three definite types of the anomaly. The first type is characterized by a ridge-like fold extending downward from the verumontanum and dividing into two membranous sheets. The outer edges of these sheets attach themselves to the rectal, lateral and pubic walls of the urethra as they extend distally; the inner or free edges may or may not unite below. In some cases of this type only a single unilateral valve is present. In the second type a ridge similar to that of the preceding type is found, but it passes upward from the verumontanum and divides into two valve-like folds which attach to the urethra just outside the vesical sphincter. The third type is a more or less disc-shaped valve, the outer edge of which is attached to the entire circumference of the urethra; a small opening toward its center prevents complete urinary obstruction. The latter variety of valve may be found in any portion of the posterior urethra and bears no relationship to the verumontanum. The valves in the following case are similar to those described in type one.

*From the Department of Urology, the Miller Clinic.

CASE REPORT

E. B., age three and a half years, male.

Complaint: difficult painful micturition, abdominal distention. Swelling of face.

Family history: Irrelevant.

Past history: Normal delivery. Breast-fed fourteen months. Chickenpox, measles and occasional "colds."

Present illness: The mother states that since birth there had been noted severe straining to empty the bladder, but for the past two months patient has cried whenever he urinated. He would strain, stand on his toes and finish the act by bending over and grasping the lower abdomen. Circumcision was done elsewhere five weeks ago, without benefit. Within the past month straining at urination became more marked and there was a protrusion of the rectal mucosa through the anal sphincter whenever micturition was attempted.

Since the onset of the dysuria there has been marked frequency and urgency of urination day and night, with the passage of only small quantities of urine. The stream has been slow in starting, with poor force and sudden cessation while straining. During the week prior to admission to the hospital a swelling of the face was noted, together with the appearance of reddish spots on the body.

Physical Examination: The patient is a boy three and a half years old, well developed, but sallow and appearing very ill.

Head and neck. The left eye shows recent hemorrhage beneath the sclera.

Throat. Negative. There is marked distention of the anterior jugular veins.

Thorax. Heart and lungs, negative. Pulse 110, regular. Temperature 100.2°.

Abdomen, distended. There is an ovoid tumor rising from the symphysis to well above the umbilicus.

Skin. Pale, with pinkish, red hemorrhagic spots on the lower abdomen and thighs. The superficial veins are very evident. The child is irritable, cries much of the time, and is apparently having marked lower abdominal distress.

External genitalia, normal.

The urine voided during the examination is grossly bloody.

Laboratory Data: Blood, hemoglobin 60 per cent. Red blood cells 3,540,000. White blood cells 14,650. Polymorphonuclear leukocytes 73 per cent, lymphocytes 27 per cent. Bleeding time, one minute, 25 seconds. Coagulation time 4 minutes.

Urine—specific gravity 1.008. Reaction acid. Albumin heavy cloud. Sugar negative. Microscopic—numerous leukocytes, clumps of pus. Many red blood cells.

Blood chemistry—Sugar 125 mgs. Creatinin 2.50 mgs. Urea Nitrogen 56 mgs.

The renal function was not determined because of

the distended bladder, which was to be decompressed.

X-ray—A cystogram (Fig. 1) shows the bladder outline irregular, trabeculated, with small cellules, and a dilatation of the bladder neck and posterior urethra. There is reflux up both ureters showing dilatation even though no attempt was made to force a large quantity of the opaque media into the bladder.

Cystoscopic Examination—This was preceded by preparatory catheter treatment. Buerger cystoscope (F. 16) inserted without difficulty. The bladder wall showed marked trabeculation. Numerous small cellules were seen. Both ureteral orifices were dilated and similar in appearance to large diverticulæ. The prostatic urethra was dilated, as was the internal sphincter, allowing easy manipulation of the cystoscope and inspection of the verumontanum. The superior crista appeared normal. The inferior crista showed redundant folds of mucous membrane, semilunar in shape, swinging downward and laterally, in a fan-shaped manner, with the apex at the verumontanum. These folds were

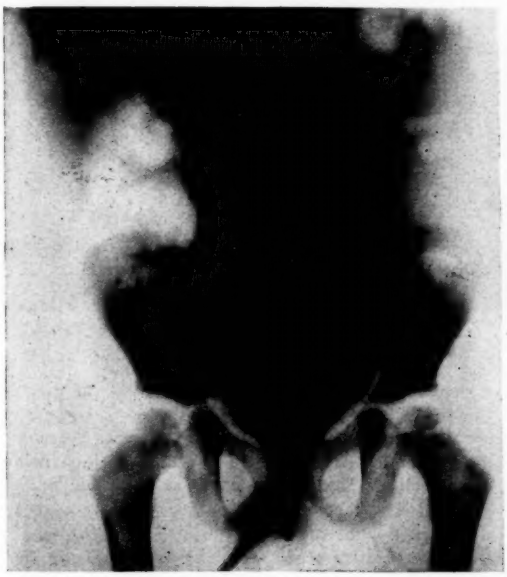

Fig. 1. Cystogram showing dilated posterior urethra and reflux up both ureters.

flattened by the cystoscope, but with a small urethroscope improvised from a trocar these folds could be seen to balloon out with the egress of fluid from the bladder.

Treatment—A cystotomy was performed. A thickened, trabeculated bladder was seen. The ureteral orifices were dilated sufficiently to be palpated. The posterior urethra and vesical sphincter were dilated, permitting the palpation of the valves on the end of a sound which had been caught in the pouch beneath. Division of the valves behind the end of the sound was carried out.

The patient made a slow recovery, and finally became afebrile. Gradually the pyuria disappeared, and the general condition rapidly improved. The urethra was dilated several times following the operation and he was voiding normally before leaving the hospital. He was seen two and one-half years later and appeared normal in every way.

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PHARYNGO-ESOPHAGEAL MEDIASTINAL FISTULA REENTERING THE ESOPHAGUS*

REPORT OF CASE

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Division of Medicine, The Mayo Clinic,
and
E. STARR JUDD, M.D.
Rochester, Minnesota

Mediastinal abscess, perforated blood vessels, and esophago-tracheo-bronchial fistula are some of the complications that may arise from ulceration as the result of an impacted foreign body in the esophagus. It is therefore imperative that all foreign bodies lodged in the esophagus should be removed as soon as possible, since perforation may take place in a short time, especially if the foreign body is large and has sharp edges.

Recently, a patient was observed in the clinic who demonstrated the rapidity with which perforation may take place, and who also presented one of the most unusual of complications, pharyngo-esophageal mediastinal fistula.

The patient, a middle-aged woman, a year preceding admission to the clinic, had choked while eating chicken, and felt the sensation of a bone sticking in her throat. Considerable pain and dysphagia followed. Nothing was done until the third day, at which time the patient felt very ill and uncomfortable, and esophagoscopy was advised. This failed to reveal the foreign body. The patient stated, however, that she thought she felt it pass down the esophagus and into the stomach just preceding the examination. The patient became progressively worse, and high fever and stupor developed. Evidence was found of a mediastinal abscess, which was drained on the tenth day through the left supraclavicular region, with excellent results, the patient recovering promptly. The dysphagia, although slight, persisted, and the wound in the left supraclavicular region continued to drain a small amount of mucoid material. In spite of further surgical interference, the sinus persisted although it drained very little. Approxi-

*Submitted for publication April 11, 1930.

mately every four or five weeks since the onset, the patient had experienced a sense of substernal pressure, malaise, slight elevation of temperature and an increase in dysphagia. Two or three days later, the sinus in the left supraclavicular region would usually open and discharge mucopurulent material for two or three days, it appeared to come in contact with a fluctuating mass. The following day the sinus in the left supraclavicular region opened and drained spontaneously. Roentgenologic examination following drainage revealed a sinus discharging from the bottom of the pharyngo-esophageal diverticulum into a large mediastinal pocket, with

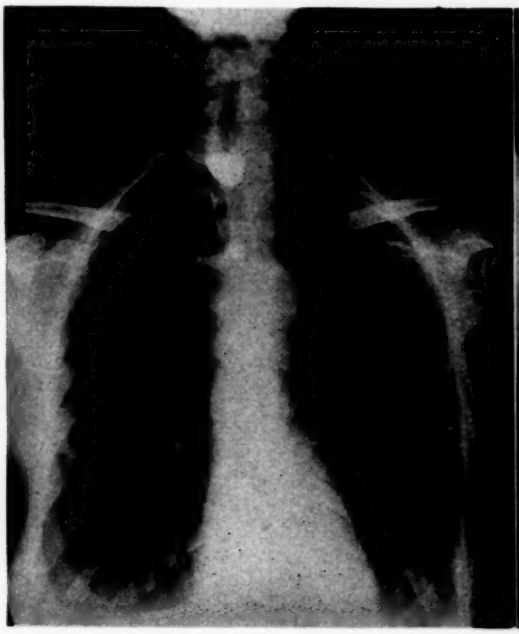

Fig. 1. Esophagus before discharge of material retained in mediastinal sinus.

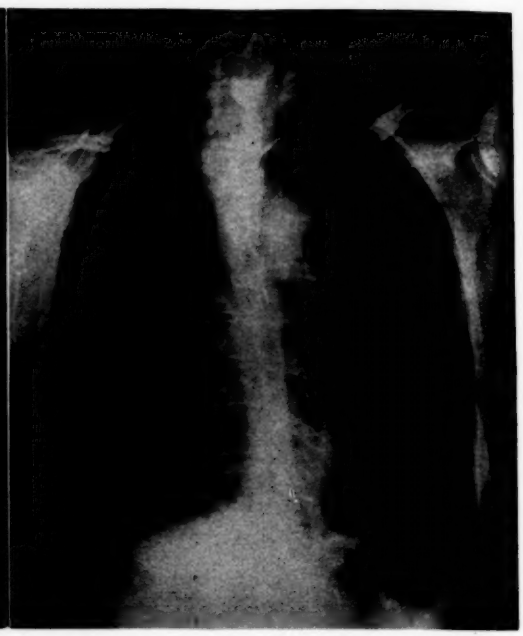

Fig. 2. Esophagus after drainage of mediastinal sinus.

which relieved the symptoms. During the time of drainage, small amounts of food that had been eaten would be discharged through the sinus. If the sinus in the left supraclavicular region did not open and drain to terminate the attacks of malaise, fever and dysphagia, the symptoms were relieved by something giving way in the thorax and discharging into the esophagus.

The foregoing cycle had repeated itself with great regularity, and at the time the patient presented herself at the clinic she felt such an attack developing.

On examination, the sinus at the base of the neck was dry, and very small. In swallowing, the patient made a peculiar noise, which is characteristic of pharyngo-esophageal diverticulum. Roentgenologic examination revealed a pharyngo-esophageal diverticulum (Fig. 1) with a small amount of barium lodged about the level of the arch of the aorta. On esophagoscopic examination the diverticulum was found filled with mucoid material, and there was obstruction in the upper third of the esophagus, which gave the impression of being due to an extrinsic mass. The passage of a number 41 French sound over a previously swallowed silk thread also demonstrated the diverticulum and the obstruction in the upper part of the esophagus. However, a number 45 French sound was passed with ease; a fistulous tract leading from the pocket to the left supraclavicular region, and another burrowing down the posterior mediastinum and emptying into the middle third of the esophagus (Fig. 2). Fluoroscopic examination disclosed that about equal amounts of barium passed down the esophagus and the sinus tract.

Apparently, the attacks of malaise, fever, dysphagia and substernal distress were the result of the tract emptying into the esophagus and becoming obstructed. The material accumulated in the mediastinal pocket until it was either discharged through the sinus to the outside, or into the esophagus, with relief of symptoms.

Undoubtedly the sequence of events in this case was the lodgment of a piece of chicken bone in the pharyngo-esophageal diverticulum, with perforation into the mediastinum and subsequent mediastinal abscess. Whether the bone went through into the mediastinum, or later was discharged into the stomach, is difficult to determine. The abscess was drained through the left supraclavicular region with the formation of a sinus tract, and the third opening into the middle third of the esophagus was undoubtedly spontaneous, although it may have been due to the foreign body burrowing its way back from the mediastinal pocket into the esophagus.

It was impossible to isolate the sac of the diverticu-

lum, and an attempt to remove it was not made. The fistulous sac was dissected out and excised. After the mediastinal sac had been drained and the sinus had filled in until it was small, the esophagus was dilated repeatedly. This seemed to give relief. When the patient was dismissed from observation she was apparently in good condition but we advised that the dilatations of the esophagus be continued.

INCORRECT LABELING OF UPSHER SMITH DIGITALIS PREPARATIONS

Tablets Folia-Digitalis (Upsher Smith) 1 grain, Tincture Digitalis (Upsher Smith) and Capsules Folia-Digitalis (Upsher Smith) 1 grain, were exempted by the Council on Pharmacy and Chemistry as having the status of official substances. The Council reports that a committee for the study of the actions of digitalis in patients suffering with pneumonia used tablets of digitalis Upsher Smith and tablets of digitalis of another firm and directed that patients receive these in uniform doses calculated to induce a moderate degree of digitalization, assuming that both specimens of tablets were correctly labeled; that after a total of 258 patients had been treated it was discovered that the tablets of digitalis Upsher Smith induced both severe and minor toxic symptoms far more frequently than those of the other firm, and that an examination of the records brought out that minor toxic symptoms were more than ten times as great in those who received the Upsher Smith tablets as in those who received the other firm's tablets and that the mortality was 49 per cent of all cases of pneumonia treated with the first, as compared with 38 per cent in all those treated with the other tablets. The Council further reports that both brands of tablets were then assayed; that the tablets of the other firm were found to be of activity stated on the label, and those of Upsher Smith to be twice the activity stated. Upsher Smith has assured the Council that any of his misbranded preparations on the market will be called in, and that in the future the greatest care will be taken to insure that the potency of these will be stated correctly. (Jour. A. M. A., April 26, 1930, p. 1305.)

THERAPEUTIC CLAIMS FOR THEOBROMINE AND THEOPHYLLINE PREPARATIONS

The Council on Pharmacy and Chemistry reports that, questions having arisen in regard to the advertising claims that might be permitted for the xanthine derivative preparations accepted for New and Non-official Remedies, the Council's referee for these products presented a review of the important literature, with special reference to the value of xanthine derivatives in vascular hypertension and arteriosclerotic conditions. In the light of this review, the Council decided that the following claims could be permitted for both theobromine and theophylline: (a) diuretic action; (b) myocardial stimulation; (c) occasionally (and more often with theophylline) relief of pain in angina and similar lancinating pains. It does not seem permissible to claim lowering of hypertension. (Jour. A. M. A., April 26, 1930, p. 1306.)

ANNUAL MEETING OF THE COUNCIL ON PHARMACY AND CHEMISTRY

The Council on Pharmacy and Chemistry held its annual meeting at the Association headquarters March 7 and 8. Extended consideration was given to the work of the newly established Committee on Foods and the proposed publication of the book "Accepted Foods." The progress made appeared satisfactory and the work appears to be appreciated by the profession, the public and manufacturers. The Council discussed the status of the streptococcus preparations for the treatment of rheumatic fever made in accordance with the method of J. C. Small: it was the consensus that, while these products are suitable for controlled investigation by qualified experimental workers, propaganda which invites their general use is not justified at this time. The Council decided that the available evidence does not demonstrate the usefulness of puerperal fever streptococcus serum. The Council decided to continue the acceptance of Type I antipneumococcic serum for New and Non-official Remedies; that Type II serum is still in the experimental stage; and that pneumococcic serum preparations representing a mixture of Types I and II pneumococci be considered unacceptable. It was decided that, while adequate clinical evidence for the potency of a liver extract must be required before acceptance, further clinical testing will not be required after a product has been shown to be active and the method of preparation shown to be satisfactory. The Council considered the rules that are to govern the use of the seal to be used by manufacturers to identify products accepted for New and Non-official Remedies or for Accepted Foods. The Council approved a proposed study of commercial allergic protein preparations and offered coöperation. The Council considered a proposed manual for the guidance of hospitals to be prepared by a committee appointed by the Council on Medical Education and Hospitals with the coöperation of the Council on Pharmacy and Chemistry. Plans for the consolidation of various committees concerned with anesthesia were discussed. (Jour. A. M. A., March 22, 1930, p. 874.)

POTENCY OF ARSPHENAMINE

There is no official standard for therapeutic potency of arsphenamine preparations. According to reports of the United States Public Health Service Hygienic Laboratory, no one brand has been definitely established as superior to others when considered from the point of view of clinical efficiency. In some foreign countries, every preparation of arsphenamine and neoarsphenamine is tested on mice for therapeutic efficiency before being used. (Jour. A. M. A., November 9, 1929, p. 1495.)

PRESIDENT'S LETTER

NOT at all infrequently some one asks the question, "How shall I choose a good doctor?" One may answer, giving many rules of guidance of more or less doubtful value, the while a still, small voice within whispers the query, "What *is* a good doctor?" Surely we must know something of what enters into the making of a good doctor before we can tell a person how to make a wise selection. Without making any attempt to answer the question it is permissible to cogitate.

Youth finishes his interneship, receives his diploma from a Class A school of medicine, successfully meets the requirements of the laws of the state in which he decides to open his office and goes to work. If he has given reasonably faithful attention to his duties before entering upon the practice of his profession, it is safe to say that he is in a position to give intelligent attention to such cases of illness as may come his way. He has abounding hope and energy. His optimism is contagious, his energy appeals, his pleasing personality attracts. Directly he is busily working, is riding a wave and surely floating to its crest.

When youth opened his office he was not a good doctor as yet. He had but started to explore the field of *experience* now opening before him. He is about to learn to be a doctor. The element of *time* now enters the equation, without which experience may not be had. What his experiences are, what they will mean to him, will depend largely upon what he does with the time he is using. If he has wisdom as a reasonably well developed attribute his time will be spent (excepting such as is justly his for rest and recreation) in carefully recording his observations, classifying his records, comparing them, thinking of the significance of his findings. Thus knowledge born of experience will grow. His *judgment,* a final and deciding factor in the making of a good doctor, will have ample opportunity to develop. If he possesses that keen discriminatory quality which we call good judgment he is well on the road to becoming a good doctor.

But the years are passing and youth is slipping away into maturity. At some point along the way the lines of life diverge. One leads to lost interest, indifference, self-satisfaction, professional mediocrity, or less, and a flabby minded old age unless death mercifully intervenes. The other leads into fresh and increasingly interesting fields. It gives breadth of understanding, it enhances the value ofexperience, it fixes firmly in the mind the lessons learned through observation and study. This line of life is marked by an insatiable thirst for knowledge. It compels him who follows it to seek for the knowledge and tales of experience of his fellows. In season and out he cries for more. This line leads him to his local medical meetings, to the state meetings, to such of the special meetings as his taste dictates. Staff meetings, if available, he surely attends. He will make flying trips to medical centers where he may spend a profitable hour with some great clinician, or at a pathological conference or an *x*-ray demonstration. Perchance he may have quiet converse with some learned mind for a little time. Thus he adds to his knowledge, makes his experiences mean something, ripens his judgment and gets zest and inspiration with which to continue his labors.

From this picture we may see clearly that work, work of the right sort, returns rich dividends in knowledge and skill and mental and moral satisfactions. As work of this sort may be done in small and out of the way places as well as in the great cities it is reasonable to suppose that "professional ability is pretty evenly distributed over the country, reputation is largely a matter of chance."

Departing from the field of cogitation to matters of fact it may be stated that in making up the scientific program for the July meeting of the State Society the committee in charge wrote letters to all members asking them to express their choice of subjects for a series of six symposia. An amazing number of answers were received. A great variety of subjects were named. The Program Committee merely acted as a clearing house for the profession at large which chose the following subjects:

1. Traumatic Surgery.
2. Carcinoma. The request here was that the most recent etiological factors together with early diagnostics be stressed.
3. Rheumatic Fever. The men appeared to be aware of new developments concerning rheumatism and expressed a wish to learn the latest.
4. Anesthesia. Clearly the profession is interested in all modern methods. Succinct definite and correlated information will be given.
5. Therapy. This subject was almost universally requested.
6. Our State Institutions. A large number of people, both lay and professional, desire to know how to get persons in and how to get them out; what is done for the inmates and how they get along. The profession evidently feels that the fine body of men in charge of these institutions are members of the profession and better acquaintance is desired.

Judging from the great flood of letters received by the Program Committee practically the entire membership of the State Society classifies for cogitative life line number two. On that basis the Duluth meeting will be immense.

S. H. Boyer

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

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Vol. XIII June, 1930 No. 6

THE MINNESOTA MEDICAL SCHOOL AND THE JULY KIDNEY SYMPOSIUM*

There is a rather brief announcement in this Journal in the May issue (page 335) of this most noteworthy educational step, planned and executed through our Professor of Medicine, Hilding Berglund. This extraordinary assemblage of men from near and far, who have made names for themselves in medical science and have noteworthy contributions to discuss in the special field pertaining to normal and abnormal kidneys, is a unique evidence of Professor Berglund's wide acquaintance and the confidence these men have in him. It is likewise an evidence of the high position in medicine granted both to our own state and its university, because these men do not casually abstract this precious time from the very best portion of their summer vacation periods.

This set of lectures is going to draw together those interested from near and far. To some, uninitiated, it may appear that the field of kidney physiology and pathology is singularly limited, and that a greater variety of subjects should be discussed. With this contention few will agree.

In the first place we might paraphrase the remark of the old teachers who said, "He who understands syphilis thoroughly in all its manifestations understands all disease." So let us say in particular that the kidney is capable of study from the widest angle of approach; it is pivotal among organs; its blood supply and its anatomical position as well as its avenues of excretion provide easy isolation. When Professor A. N. Richards, for example, demonstrates to us his superb work on kidney capillaries and their distribution he is virtually introducing us to the body capillary bed as a whole. A full knowledge of kidney physiology would mean a long step toward knowledge of the body as a whole.

We have all talked about kidney classifications and the name of Volhard comes first to mind. Many might find it disconcerting whether to place him in the time of Harvey or Virchow. It will be as comforting as impressive to see him in the living—and incidentally observe the distance he travels to be with us!

This sketch is something of a summons or challenge to our state of hibernation or inebriety. We must not sit purposelessly by, unaware of this great treat and opportunity. Let us give these men an audience; let us linger about the University on some of these days at least; let us not fail to show to Professor Berglund, the other University men and their guests our full appreciation of this evidence that our medical school has not only a commanding position, but an intense zeal to come into a position second to none.

E. L. TUOHY, M.D.

*July 7 to 18 at the University Medical School.

"JAKE" PARALYSIS

"Jake" paralysis has recently been given wide publicity in the lay press. Reports are that many have been stricken in Oklahoma, Kansas, Illinois and Massachusetts. The prime offender is Jamaica Ginger, which masquerades under the name of "Jake." Reports have it that it has been dispensed at soda fountains, soft drink parlors, and has even been "bootlegged."

A number of years ago weaker extracts of ginger were on the market, and a propensity for drinking them grew up in the prohibition states, and during the early days of national prohibition. However, even the so-called "Jake" addicts were unable to drink the U.S.P. extracts, with its 4 per cent of ginger. Manufacturers of extracts designing to meet this beverage demand, therefore, used only about one-half of 1 per cent of ginger extract, and made up the rest of the 4 per cent non-volatile matters by preparations which cannot easily be detected by the drinker, and which will pass a superficial test for solid content. Such adulterants as castor oil, other bland viscous oils, powdered resin, pine oil, tar and oleoresin have frequently been discovered. Lately creosol and phenol products have been discovered.

The exact nature of the poisonous product is as yet unknown. The probabilities are that it may be a higher alcohol. Clinically these cases resemble typical alcoholic polyneuritis, with partial, or complete, paralysis of the distal portions of the four extremities.

Jamaica ginger may be manufactured only under permit from the Bureau of Prohibition, but it is believed that many manufacturers make this sub-standard ginger to the order of distributors, who supply their own labels, and who are, therefore, free to resell the product to grocery stores and other vendors, practically free from Government interference, because the extract conforms to the Food and Drug Acts in label requirements, and apparently as to solid content. The Government is endeavoring to trace these products to their source of manufacture, and close them up if it cannot be shown that the adulterants were not added after the shipment left the manufacturer. That this has proved to be a difficult task is shown by the widespread appearance of another product of Prohibition—the so-called "Jake" paralysis. Just how serious, from a prognostic standpoint, this form of paralysis is, cannot be stated at this time. Neuritis resulting from "moonshine" has often been found to be very prolonged and disabling. It is probable that the same situation, or a worse one, will result from this unknown poison.

G. N. R.

UROSELECTAN

The newly developed iodine preparation known as Uroselectan promises to be of very material assistance in the diagnosis of kidney lesions. Being a stable iodine combination it can be given intravenously with slight chance of iodism resulting, and its excretion by the kidney visualizes the urinary tract in the *x*-ray film. Occasionally the patient experiences a general reaction with digestive disturbances, pain in the arms, etc., which may be due to delayed elimination or drug idiosyncrasy.

With the technic used at present the kidney, pelvis and first part of the ureter and the bladder may show up well in the *x*-ray. The middle and lower portions of the ureter evidently do not contain the opaque urine in sufficient quantity to render much information as to the condition of this portion of the tube.

It is evident that even with improvement in the present technic being tried out by urologists, this new method can never entirely replace cystoscopic examination. In instances, however, where cystoscopy is contraindicated or where ureteral catheterization is impossible, or the pelvis cannot be injected, uroselectan intravenously can give information not otherwise obtainable. In cases of hydronephrosis or hydroureter this newer technic should give conclusive evidence.

This new preparation may acquire a very important place by replacing the opaque solutions usually used to visualize the urinary tract. It is thought by some to be less irritating and promises to give just as clear-cut pictures as the iodide solutions now used.

It is to be hoped that the intravenous use of uroselectan will not prove to be simply another *x*-ray examination to be used indiscriminately. This is not likely, however, for it involves an intravenous administration and *x*-ray exposure at half-hour and hour and a half intervals, and does not give the last word regarding the state of the urinary tract.

The interested reader is referred to two abstracts on the subject which appear in this issue.

OF GENERAL INTEREST

Dr. Joseph Borg, Saint Paul, who is at present taking post-graduate work in internal medicine in Vienna, is expected to return July 1.

Dr. Walter D. Abbott, formerly of the Mayo Clinic, Rochester, is now associated with Dr. Harry A. Collins at 820 Equitable Building, Des Moines, Iowa.

Dr. E. De Witt Simpson has moved into his new offices at 401 Medical Arts Building, Minneapolis, where he is engaged in the practice of general surgery.

Dr. Donald C. Smelzer, for the past five years superintendent of the Miller Hospital, Saint Paul, has been appointed superintendent of the Graduate Hospital, Philadelphia, where he will take over his duties July 1.

The Minneapolis General Hospital is now offering a six months' technician's course in electrocardiography and medical photography. Information concerning the course may be obtained from the superintendent, Dr. Walter E. List.

The Samuel D. Gross Prize of the Philadelphia Academy of Surgery has been awarded by the Trustees to Dr. Emile Holman, Stanford University Hospital, San Francisco, California, for his essay on "Abnormal Arterovenous Communications."

THE JOHN PHILLIPS MEMORIAL PRIZE

The American College of Physicians announces the John Phillips Memorial Prize of $1,500.00, to be awarded for the most meritorious contribution in Internal Medicine and sciences contributing thereto, under the following conditions:

1. The contribution must be submitted in the form of a thesis or dissertation based upon published or unpublished original work.
2. It must be mailed to the Executive Secretary† of the American College of Physicians on or before August 31, 1930.
3. The thesis or dissertation must be in the English language, in triplicate, in typewritten or printed form, and the work upon which it is based must have been done in whole or in part in the United States or Canada.
4. The recipient of the prize would be expected to read the essay at the next annual meeting of the College, after which he would be officially presented with the prize by the President.
5. The College reserves the right to make no award of the prize if a sufficiently meritorious piece of work has not been received.
6. The announcement of the prize winner will be made not later than two months before the annual meeting.

†Address American College of Physicians, E. R. Loveland, Executive Secretary, 133-135 S. 36th Street, Philadelphia, Pa.

The nurses of the Third District of the Minnesota State Registered Nurses Association have announced the following schedule of fees for private duty nursing in hospitals, effective April 1, 1930: 12 hour duty—$7.00 per day; 10 hour duty—$6.00 per day; 8 hour duty—$5.00 per day.

Dr. Harold D. Palmer, formerly of Saint Paul, graduate of the class of 1927, University of Minnesota, has recently announced his association with Dr. Edward A. Strecker of Philadelphia, in the practice of Neurology and Psychiatry. His offices will be in the new Institute for Mental Hygiene of the Pennsylvania Hospital, Philadelphia.

Beginning this year the American Association for the Study of Goiter will award a cash prize of $300 annually for the best original thesis dealing with some phase of the goiter problem. Theses should be submitted by June 1, to Doctor Walter M. Simpson, Chairman of the Essay Committee, Miami Valley Hospital, Dayton, Ohio. The award will be given immediately following the coming meeting of the Association which is to be held in Seattle, Washington, July 10 to 12, 1930.

STATE ASSOCIATION NEWS

Five Minnesota cities have booked the 1930 medical short courses offered under the auspices of the Minnesota State Medical Association and the University of Minnesota Extension Division. Wadena and Faribault were the last to book them. They opened the series the week of May 12. Willmar, Brainerd, and Winona preceded them.

Meetings took place in Faribault, May 19, and in Wadena, May 23, with executive officers of the association in charge of both. The tuberculosis meeting, arranged by the Minnesota Public Health Association, was held in Faribault, May 26. It is scheduled for Wadena, June 6. Program devoted to cancer, obstetrics, heart disease, arthritis, hospital management and other subjects chosen by the individual county medical societies sponsoring the courses are also scheduled.

F. Manley Brist, investigating attorney for the State Board of Medical Examiners, addressed the Blue Earth Valley Medical Society at Fairmont, May 1, on legal aspects of association affairs.

Officers of the state association addressed a special meeting of the Freeborn County Medical Society at Albert Lea on their way home from the 1930 convention of the Iowa State Medical Association, May 15. S. H. Boyer, president, E. A. Meyerding, executive secretary, and F. Manley Brist, were in the party.

Materials for lay talks on sex hygiene, diphtheria, child health and for a nurses' graduating exercise were sent from state association headquarters to members requesting them this month. This service is available to any member. Address the Minnesota State Medical Association, 11 W. Summit Avenue, St. Paul, Minn.

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

A Public Health Program for the Doctors' Wives

An important and interesting health program evolved by the Women's Auxiliary of the American Medical Association is now before the Public Health Education Committee of the State Association.

This program proposes a very comprehensive lay health education study for county auxiliaries. It is designed, naturally, to cover the entire United States and whatever problem particularly confronts any given community.

The program has already received the approval of the American Medical Association Advisory Council. It is now submitted to the Minnesota Committee by the Auxiliary for approval and criticism and also for selection of what may particularly apply to the general situation in Minnesota.

The Committee has not yet acted upon the program though action is pending. A résumé of the fundamentals upon which the entire proposal is based and the general outline of study follows below for the information of members of the profession in Minnesota in whose communities its effects may be far-reaching.

The fundamentals upon which improvement of public hygiene should be based, according to the proposed program, are, briefly:

1. Recognition of the fact that public health is a highly technical job requiring scientific, technically trained workers.
2. Recognition of the fact that every state, county and city is entitled to a scientific full-time health department.
3. Recognition of the fact that the first and most fundamental job for lay organizations like the Auxiliary is to secure such a department for their city, county or town.
4. Recognition of the fact that where such departments do not exist health activities must be initiated and carried on by volunteer organizations.
5. Recognition of the fact that no health department of whatever kind can do effective work without the intelligent coöperation of the public.

Health officials know, says the national auxiliary, that it is not always the work which makes the greatest emotional appeal to the public which most needs to be done. Unfortunately most women do not know this. It is something that doctors' wives might well undertake to teach other women.

The National Auxiliary recommends, therefore, that each state auxiliary undertake, under the direction and with the help of the Public Health Committee of the State Medical Association, to study the following:

1. Fundamental principles of health promotion and disease prevention.
2. The set-up considered essential by public health experts for an effective state health department, of qualifications of personnel, budget and the like.
3. State health machinery and conditions.

Recommendations for educational work to be done by individual county auxiliaries are to be based upon the conditions found.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of June will be as follows:

June 4—Cardiac Neurosis.
June 11—Minnesota Department of Health.
June 18—Pyelitis in Young Girls.
June 25—Pituitary Gland.

STATE MEDICAL MEETING

A crowded three days' program is practically complete for what promises to be the most important and valuable state meeting in the history of the Minnesota State Medical Association.

It opens in Duluth, July 15, less than two months from the date of this issue of MINNESOTA MEDICINE, and the program committee wishes to remind members of the association that hotel reservations should be made immediately.

Positive confirmation has been received of the participation of Primarius Lorenz Boehler, Chief Surgeon and Director of the Vienna Accident Hospital, in the symposium on traumatic surgery, which is one of the most keenly anticipated features of the meeting.

Medical men who have been to Vienna recently have been attracted by Boehler's Clinic because of his original ideas in treating fractures. They have all been impressed with the rationality of his treatment and the brilliancy of his results. A great part of his work originated during the World War but he had become quite highly specialized in his work even before the war. In the past nineteen years he has treated more than 10,000 fractures, studied 27,000 roentgenograms, dissected more than 3,000 fractures on the post-mortem table. The latter was done because of dissatisfaction with the end-results with fractures, that he might study the cause of the failures.

Perhaps no other organization in the world is more highly efficient for treatment of fractures than that of Professor Boehler of Vienna.

The distinguished Viennese surgeon will arrive in America early in June. His method of reduction of fresh fractures has caused a sensation in the medical world. It is accomplished painlessly by local anesthesia and in such a manner that the period of treatment is greatly shortened. The Boehler method of treatment will soon be universal, we are told, and the presence of the eminent surgeon should add enormously to the interest in this symposium.

Among other important guests from outside the state who will be present for the meeting are: Karl Meyer, Chicago, Assistant Professor of Surgery at Northwestern University, and Medical Superintendent of Cook County Hospital; Ralph Kinsella, St. Louis, Professor of Internal Medicine at St. Louis University; Arnold S. Jackson, Jackson Clinic, Madison, Wisconsin; E. C. Davidson, Detroit, Junior Surgeon, Harper Hospital, and Attending Surgeon at the Children's Hospital of Michigan; R. S. Dixon, Director of the Division of Social Hygiene, Detroit Department of Health; W. J. Burns, Executive Secretary, Wayne County Medical Society, Detroit; J. G. Crownhart, Secretary, Wisconsin State Medical Association, Madison; Olin West, Secretary of the American Medical Association, Chicago.

Four other important symposia, selected by popular vote of members, are on the program. They will be on Immunology, Malignance, Rheumatic Fever, and Anesthesia.

One evening will be given over to a discussion of the economic trend of medicine; another, to fraternity meetings, and another to the annual banquet of the association.

The Canti film called, "A Cinematograph Demonstration of Living Tissue Cells Growing *in Vitro*," will be shown also as a feature of this year's meeting. It has been secured in response to numerous requests to the committee.

Arrangements for reception of members are practically complete under the direction of the Duluth committee. Attractive entertainment for wives of members has had especial attention.

The complete scientific and entertainment program will be ready for publication in the July issue of MINNESOTA MEDICINE. Watch for it!

SYMPOSIUM ON THE KIDNEY IN HEALTH AND DISEASE

Previous announcement of this unusual opportunity which comes to the very door of Minnesota physicians has already appeared in our columns. While of peculiar interest to internists the subject has a very general appeal.

An effort will be made to correlate many of the known facts under the heading of the anatomy, physiology and pathology of the kidney, with special emphasis on the newly discovered facts regarding the kidney and recent investigative work.

The meeting will open Monday, July 7, 1930, at the University hospital and will continue until Friday, July 18, with an intermission from Saturday noon, July 12, to the following Tuesday to enable attendance at the State Medical meeting in Duluth, which opens July 14. Meetings will begin at 9 A. M. each day and will include morning and afternoon sessions with round table discussions in the evening.

A glance at the following list of well known participants should indicate the treat that is in store for members of the profession:

Dr. A. J. Carlson, University of Chicago.
Dr. G. Carl Huber, University of Michigan.

Dr. E. K. Marshall, Johns Hopkins Medical School.
Dr. R. E. Scammon, University of Minnesota.
Dr. C. M. Jackson, University of Minnesota.
Prof. F. Volhard, Frankfort-on-the-Main.
Dr. A. N. Richards, University of Pennsylvania.
Dr. E. T. Bell, University of Minnesota.
Dr. R. N. Bieter, University of Minnesota.
Dr. H. L. White, Washington University, St. Louis.
Dr. W. F. Longcope, Johns Hopkins Hospital.
Dr. Paul B. Rehberg, University of Copenhagen.
Dr. L. G. Rowntree, Rochester, Minnesota.
Dr. H. Berglund, University of Minnesota.
Dr. A. D. Hirschfelder, University of Minnesota.
Dr. L. Leiter, University of Chicago.
Dr. R. A. Gortner, University of Minnesota.
Dr. Harold Diehl, University of Minnesota.
Dr. McN. Wetherby, University of Minnesota.
Dr. H. P. Wagner, Rochester, Minnesota.
Dr. G. E. Fahr, University of Minnesota.
Dr. N. M. Keith, Rochester, Minnesota.

All correspondence in regard to the symposium should be addressed to the Symposium, University Hospital, Minneapolis, or direct to Dr. Hilding Berglund, University Hospital, Minneapolis.

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meeting of the Scott-Carver County Medical Society was held at New Praque on May 13, 1930. Dr. G. T. Schimelpfenig, of Chaska, was elected to membership in this society. The Honorable Judge C. M. Tifft read a very instructive paper on "Medical Jurisprudence." Dr. E. E. MacGibbon, from the University of Minnesota Dental School, gave a very interesting and instructive address on "Diseases of Mutual Interest to a Doctor and Dentist."

Dr. F. A. Dodge, of LeSueur, one of the charter members of this society, made a few remarks about the beginning of the society. Mr. A. J. Suel, editor from New Prague, gave a short but interesting address on "The Press and the Medical Profession." A rising vote of thanks was given the speakers. It was decided to hold our next meeting, which will be the annual meeting, at Shakopee in June, 1930.

B. H. Simons, M.D., *Secretary.*

MEEKER COUNTY MEDICAL SOCIETY

S. S. Dulude, Dassel, was recently elected president of the Meeker County Medical Society. K. A. Danielson, Litchfield, will be secretary and treasurer; A. W. Robertson, Litchfield, will be delegate; H. E. Wilmot, Litchfield, will be alternate; and D. C. O'Connor, Eden Valley, and A. W. Robertson, Litchfield, will serve as board of censors for the society.

STEARNS-BENTON COUNTY MEDICAL SOCIETY

New officers of the Stearns-Benton County Medical Society are: President, E. M. Kingsbury, Clearwater; Vice-president, H. B. Clark, St. Cloud; Secretary, P. E. Stangl, St. Cloud; Treasurer, F. J. Schatz, St. Cloud; and delegate, C. B. Lewis, St. Cloud.

NORTHWEST PEDIATRIC SOCIETY

Dr. Erling S. Platou of Minneapolis was elected president of the Northwest Pediatric Society at the annual meeting. Dr. E. D. Anderson of Minneapolis is vice president, and Dr. F. G. Hedenstrom of St. Paul, secretary-treasurer.

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

The Redwood-Brown County Medical Society held its annual meeting at New Ulm Union Hospital, May 14, 1930. After a banquet the following were elected to office:

President, Dr. G. F. Reineke, New Ulm; vice-president, Dr. Herman Just, Lafayette; secretary-treasurer, Dr. Wm. A. Meierding, New Ulm (re-elected); delegate to 1931 convention, Dr. Theo. Hammermeister, New Ulm; alternate, Dr. F. H. Dubbe, New Ulm.

Appointment of committees was as follows:

Publicity Committee, Drs. Weiser, Kiefer and Rothenburg. Committee on Public Policy and Legislation, Drs. Rothenburg and Hammermeister. Committee on Maternal and Infant Hygiene, Drs. Weiser and Jamieson.

Mr. F. A. Augustin, of Minneapolis, put on the screen three films showing "Movement of Alimentary tract in Experimental Animals," "The Influence of Drugs on Gastro-intestinal Motility," and "The Anatomy of the Abdominal Wall."

Attorney Linus Glotzbach, of New Ulm, gave a talk on "Medical Economics."

Dr. Herman Just, of Lafayette, read a paper on "Bacillary Dysentery."

A committee was appointed to study and recommend for adoption a basic fee schedule.

Wm. A. Meierding, *Secretary.*

AMERICAN PROCTOLOGIC SOCIETY

The thirty-first annual session of the American Proctologic Society will be held at Buffalo, New York, June 22, 23, 24, 1930, with headquarters at the Statler Hotel.

While the society has a membership limited to fifty Fellows and thirty Associates, regular practitioners who are members of the American Medical Association are cordially invited to attend the meeting.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

The fifty-second semi-annual meeting of the Southwestern Minnesota Medical Society was held at the Ashton Memorial Hospital, Pipestone, Minnesota, May 6, 1930.

Drs. N. J. Nessa, S. A. Kellar, and C. W. Forsberg, all of Sioux Falls, South Dakota, gave interesting talks.

The following members were elected to membership in the Society: Dr. D. P. Maitland, Jackson, Minnesota; Dr. B. M. Stevenson, Fulda, Minnesota; Dr. A. L. Pertl, Windom, Minnesota; Dr. S. Engh, Jackson, Minnesota; Dr. V. J. Telford, Edgerton, Minnesota, and Dr. C. V. Bateman, Mountain Lake, Minnesota.

E. G. McKeown, M.D., *Secretary-Treasurer.*

WOMAN'S AUXILIARY
Minnesota State Medical Association

ANNUAL MEETING OF A. M. A. AUXILIARY IN DETROIT—JUNE 23-27

Plans for the annual meeting of the National Auxiliary in Detroit, June 23-27, come on apace. The Auxiliary as an organization is occupied only with business affairs, and has nothing whatever to do with any social gatherings except the official Auxiliary luncheon. Members of the Board of Directors are Mrs. William Gerry Morgan, District of Columbia; Mrs. Olin West, Illinois; Mrs. L. T. Harris, Michigan; Mrs. Walter Jackson Freeman, Pennsylvania, and Mrs. Southgate Leigh, Virginia, chairman. Mrs. Basil Loren Connelly is chairman of the Detroit committee for the convention proper, and Mrs. Burt Shurly of the social activities.

The Roof Garden of the Hotel Tuller, next to the Statler, will be headquarters for all Auxiliary business —registration, meetings, etc.—and the Auxiliary luncheon on Tuesday, June 24. There will be no registration fee, but members will buy their own luncheon tickets—$1.50. The registration bureau will be open Monday, Tuesday and Wednesday, June 23, 24, 25, from 9 to 4; Thursday and Friday, June 26, 27, from 9 to 12. Programs, badges, etc., may all be procured here, and invitations, tickets and transportation cards must all be procured here *in advance*.

The meetings are open to every woman attending the convention, and under Mrs. Hoxie's leadership they are bound to be well worth the trip. There will be three morning sessions, Tuesday, Wednesday and Thursday, June 24, 25, 26. The afternoons and evenings are all left free for sightseeing and social activities, for which many plans are in the making. Details have not yet been announced, but they include motor and boat excursions, and visits to some of the handsome private estates in the environs, including that of Mr. Henry Ford. The Detroit Museum of Art is among the best in the United States. No parties have been scheduled during business hours.

No one may represent her state in any capacity whose state dues are not fully paid. The Chairman of the Committee on Credentials and Registration is Mrs. Ledru Otway Geib, 3860 St. Clair Avenue, Detroit.

Only delegates may take an active part on the floor of the convention, but alternates should attend all sessions and hold themselves in readiness to take their delegates' place if necessary. All resolutions must be in writing and signed, and in the hands of the committee 24 hours before the session at which they are to be presented. Mimeographed copies will be distributed as the delegates take their seats. The Chairman of the Committee on Resolutions is Mrs. Augustus S. Kech, 218 Logan Avenue, Altoona, Pa.

The Board of Directors meets Monday, June 23, at 2:30 P. M. All State presidents and presidents-elect are urged to attend.

The business meeting is scheduled for Tuesday, June 24, at 9:30 A. M., at which committee reports and other matters will be presented.

A Workers' Conference will take place Wednesday, June 25, at 10 A. M. State officers and committee chairmen especially are urged to attend. This meeting should prove interesting to all members of the auxiliary.

A post-convention meeting will be held Thursday, June 26, at 9 A. M., for the purpose of planning the work for the ensuing year.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

MASSEUR SENTENCED TO TEN TO FORTY YEARS IN PRISON

State *vs.* Harold Martin

On Friday, May 16, Harold Martin, 59 years of age, masseur of Minneapolis, was convicted of manslaughter in the first degree following the death of a young woman from an abortion. On May 17th, the Hon. Judge Dickinson sentenced Martin to a term of ten to forty years at hard labor in the State Prison at Stillwater. Martin's sentence to prison was doubled because of his prior conviction in 1914 on a charge of murder in the second degree. Martin served seven years of the previous sentence and was released from prison.

Immediately following his conviction Martin was served with a notice to appear before the State Board of Medical Examiners and show cause why his license to practice massage should not be revoked. The matter was heard by the Medical Board on Tuesday, May 20. There being no appearance on the part of Martin, his license was summarily revoked.

Martin claimed to have been born in Liverpool, England, and to have been a physician and surgeon in that country. However, he never was licensed in this state as a physician and surgeon but in 1927 he secured a massage license from the former Massage Board.

COROZONE

The Corozone unit is a small portable ozonator which can be operated on the ordinary electric light circuit. Ozone in sufficient concentration to kill bacteria is not suitable for ordinary respiration because of its irritant action. Ozone cannot be used as a substitute for good ventilation in a room any more than deodorants or perfume can be used as a substitute for bathing the body. There has been no sound scientific work brought forward to show that there is any place whatever for ozone in problems of ventilation. (Jour. A. M. A., April 3, 1930, p. 1089).

CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I have a patient, a girl eight years old, who has been sick since April 15, 1930, with fever. During the last week in February, 1930, she had measles with normal convalescence, except that she complained of an earache for about four or five hours one day. Past history: Scarlet fever at three years, complications were cervical adenitis, acute glomerulonephritis with urinary suppression, acute endocarditis of mitral and aortic valves with secondary cardiac hypertrophy and dilation. She was in bed for about six months following scarlet fever and has been underweight and frail since that time. Has bronchitis every winter, especially severe before a tonsillectomy which was done in 1928.

Present illness: On April 15th, her mother thought she had a fever, and on taking it found temperature 102.5. This lasted three or four hours and then went down. It came up the next day a little higher and stayed up a little longer, and continued to do the same up to the present. I saw her first April 21, 1930.

Physical examination revealed old heart lesion; occasional crepitant râle, left lower lobe; palpable spleen. The right ear drum was bulging. Blood vessels along the center were engorged, but there was no tenderness or edema of the mastoid region. There was slight impairment of hearing. Temperature 104.5; pulse 130. I thought from the appearance of the ear drum that it would probably rupture, so I advised waiting a few days. I saw her again April 28th. She still had no complaints other than temperature going up every day. Occasionally had chill before fever and sweating when fever dropped. Temperature would stay up about four hours, and was going to 105.5. I did a von Pirquet, took blood for a Widal, for agglutination against undulant fever—all were ngeative. April 30th, I did a paracentesis. The ear immediately discharged thin watery pus and has been discharging ever since. Discharge is very profuse. Temperature elevation, chills, and sweats have continued as before. Since May 5th, she has been in the hospital. Mastoid area has never been tender or edematous. *X*-ray of chest shows chronic bronchitis; apices are clear. *X*-ray of mastoid shows hazy outline of cells. Leukocyte count varies from 9,000 to 10,000; temperature from 97 to 106.8; pulse 90 to 120. Widal and von Pirquet have been repeated and are negative. Otoscopic examination showed some bulging of posterior wall with pulsation. On one occasion there was a few clumps of pus in the urine, but several specimens since have been negative. There is no tenderness in the kidney region.

What treatment would you follow? Would you advise mastoidectomy or to leave it alone and await further developments?

Answer:—The history and physical findings suggest acute mastoiditis with lateral sinus thrombosis. Mastoidectomy is advised, and if the lateral sinus is involved possible jugular ligation should be done. There is also the possibility of lighting up an old infection of the heart valves and a possible recurrence of the glomerulonephritis. I do not believe it is advisable to wait any longer. An operation should be done at once.

2. *Question.*—Patient is a young man, twenty-four years old, farmer, single, robust in appearance; comes to me complaining of drowsiness and tiredness. He began to notice this along in February of this year. In March felt feverish, but never took his temperature. Has never had any chills. There is a slight headache which gradually grew worse. About three weeks ago had two ulcerated teeth extracted and felt some better for a while, but last ten days has been getting worse and complains of fatigue. Other complaints—nocturia three or four times a night, constipation, poor appetite, fifteen pound weight loss. No particular aches or pains. Father, sixty-one, has been feeling poorly in about the same way and for about the same length of time. Mother living and well. Four brothers and one sister living and well. Under observation his temperature ranges from 99.6 to 104.6, pulse 80 to 108, respirations 20 to 30.

Physical examination showed soft systolic murmur, no glandular enlargement, no areas of tenderness or masses. Today I thought I found a slight enlargement of the spleen. Urine negative except for an occasional granular cast. Hemoglobin 75 per cent, erythrocytes 3,640,000, leukocytes 7,830; differential—polymorphonuclear leukocytes 52, lymphocytes 39, monocytes 9. Blood pressure 94/50. *X*-ray of chest shows calcified lymph nodes, and probably a little more infiltration from hilum out, but this is not definite.

Answer.—The following possibilities should be considered: (1) Undulant fever—please send about 2 to 5 c.c. of blood in a Wassermann test tube to the State Department of Health and mark it "for undulant fever." It is very important to mark the tube. This is a strong possibility because of the number of cases of undulant fever that are present throughout the country. In addition, I would send some blood from the father, who has the same complaint. As a general rule, undulant fever victims feel fairly well, have a high fever, and do not have any special complaints. In addition to testing the blood for undulant fever, the State Department of Health will also make tests for tularemia, typhoid fever, and paratyphoid fever.

(2) Subacute bacterial endocarditis—may be diagnosed by a blood culture and embolic signs in the spleen and kidney. Very often patients suffering with bacterial endocarditis will have a splenic infarct. Hematuria is the other diagnostic sign. Petechia may also be demonstrated in the skin.

(3) Urinary tract infection—pyelitis, pyelocystitis, or perhaps a tuberculosis of the kidney. Examine sediment.

(4) Pulmonary tuberculosis—if there is any sputum, it would be advisable to have it examined for tubercle bacilli.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

MEAD JOHNSON & Co.

Mead's Dextri-Maltose with Vitamin B.

PARKE, DAVIS & Co.

Ampoules of Pitocin 0.5 c.c.

ELI LILLY & Co.

Merthiolate Jelly, Lilly

Merthiolate Ointment, Lilly

E. R. SQUIBB & SONS

Squibb's Dextrose-Vitavose

FREDERICK STEARNS & Co.

Synephrin

Synephrin Solution "A"

Ampoules Synephrin-Procaine, 3 c.c.

Hypodermic Tablets Synephrin-Procaine

The following article has been exempted and included with the List of Exempted Medicinal Articles (New and Non-official Remedies, 1929, p. 481):

G. D. SEARLE & Co.

Stable Solution Dextrose and Sodium Chloride (Searle)

TRUTH ABOUT MEDICINES

Diphtheria Toxin-Antitoxin Mixture 0.1 L. + Nonsensitizing (Sheep).—A diphtheria toxin-antitoxin mixture (New and Non-official Remedies, 1929, p. 360), each c.c. of which constitutes a single dose of diphtheria toxin neutralized with the proper amount of antitoxin produced from sheep. It is marketed in packages of three vials, each containing 1 c.c.; in packages of one vial containing 10 c.c.; in packages of one vial containing 30 c.c.; and in packages of thirty vials, each containing 1 c.c. United States Standard Products Co., Woodworth, Wis.

Tablets Tutocain No. 6.—Each tablet contains tutocain (New and Non-official Remedies, 1929, p. 51) 0.05 Gm. Winthrop Chemical Co., Inc., New York.

Ampoules of Pitocin 0.5 c.c.—Each ampule contains more than 0.5 c.c. of pitocin solution (Jour. A. M. A., July 13, 1929, p. 117). Parke, Davis & Co., Detroit.

Merthiolate Jelly 1:2,000.—It contains merthiolate (Jour. A. M. A., December 7, 1929, p. 1809) 0.05 per cent, eucalyptol 0.016 per cent, eugenol 0.016 per cent in a water-soluble base. Eli Lilly & Co., Indianapolis.

Merthiolate Ointment 1:1,000.—It contains merthiolate (Jour. A. M. A., December 7, 1929, p. 1809) 0.1 per cent in a petrolatum base. Eli Lilly & Co., Indianapolis. (Jour. A. M. A., April 19, 1930, p. 1237.)

Butesin Picrate Eye Ointment.—An ointment containing 1 per cent of butesin picrate (New and Non-official Remedies, 1929, p. 54) in a petrolatum base. Abbott Laboratories, North Chicago.

Pneumococcus Antibody Solution, Types I, II and III Combined-Mulford (New and Non-official Remedies, 1929, p. 346).—This product is also marketed in packages of four 50 c.c. double-ended vials with one complete intravenous outfit. H. K. Mulford Co., Philadelphia.

Ampules Dextrose (d-Glucose) 10 Gm., 20 c.c.—Each ampule contains dextrose (New and Non-official Remedies, 1929, p. 240) 10 Gm., in distilled water, to make 20 c.c. Lakeside Laboratories, Inc., Milwaukee, Wis.

Ampules Sodium Cacodylate 0.243 Gm. (3 3/4 grains), 5 c.c.—Each ampule contains sodium cacodylate (New and Non-official Remedies, 1929, p. 73) 0.243 Gm. (3¾ grains) in 5 c.c. of solution. Lakeside Laboratories, Inc., Milwaukee, Wis. (Jour. A. M. A., March 1, 1930, p. 634.)

Squibb's Dextro-Vivatose.—A mixture of Squibb's vitavose (New and Non-official Remedies, 1929, p. 244), 1 part, and dextrose, 2 parts. E. R. Squibb & Sons, New York. (Jour. A. M. A., March 29, 1930, p. 920.)

FOODS

The following products have been accepted as conforming to the rules of the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association:

Klim Powdered Whole Milk (Merrell-Soule Co.).—It is whole milk from which all but about 2 per cent or less of the normal water has been removed by means of the spraying process of drying milk. It contains: fat, 28.0 per cent; protein, 26.7 per cent; lactose, 38.0 per cent; ash, 5.8 per cent; water, 1.5 per cent. Klim milk is used for supplementary feeding to be used according to a physician's formula.

Borden's Natural Flavor Malted Milk (The Borden Co., New York).—It is a processed mixture of barley malt, wheat flour and whole milk, reduced to powdered form. The product contains: fat, 9.2 per cent; protein, 15.5 per cent; lactose, 13.5 per cent; maltose, 35.6 per cent; dextrin, 20.2 per cent; ash, 3.8 per cent; moisture, 2.2 per cent. It is easily digested.

Mellins' Food (Mellin's Food Co., Boston).—It is a milk modifier. It contains: fat, 0.16; protein, 10.35; maltose, 58.88; dextrins, 20.69; soluble carbohydrates, 79.57; salts, 4.30; water, 5.62. Mellin's Food is a soluble, easily digestible dry extract made from wheat flour, wheat bran, malted barley and potassium bicarbonate.

Mellin's Food Biscuits (Mellin's Food Co., Boston).—They contain a large percentage of Mellin's Food. (Jour. A. M. A., April 12, 1930, p. 1145.)

Peter Pan Bread (P. F. Peterson Baking Co., Omaha).—A thoroughly baked, white bread having a soft velvety texture and sweet flavor.

Clapp's Original Approved Baby Soup and Strained Vegetables (Harold H. Clapp, Inc., Rochester, N. Y.).—Baby Soup: A combination of beef juice and vegetables. Wheatheart Soup: A combination of wheat germ, vegetables and cereals. Strained Vegetables: Spinach, wax beans, carrots, asparagus, peas, beets, prune pulp, apricot pulp and tomatoes. In these products all possible food values are retained and the least amount of water is used in cooking.

Checkr-Redi-Cooked Oats or Checkr Rolled Oats (Ralston Purina Co., St. Louis).—Checkr-Redi Cooked Oats have been precooked to bring out their mellow

flavor and to make them quickly prepared and easily digested.

Minute Gelatin (Minute Tapioca Co., Inc., Orange, Mass.).—Pure granulated gelatin offered in convenient size cartons for household use. (Jour. A. M. A., March 1, 1930, p. 635.)

Borden's Sweet Chocolate Flavor Malted Milk (The Borden Co., New York).—It has the following average composition: fat 6.7%; protein 9.7%; sucrose 47.8%; other carbohydrates (maltose, dextrin, lactose) 31.0%; ash 2.4%; insoluble chocolate solids 0.4%; moisture 2.0%. This product differs from other chocolate malted milks in that the cocoa is cooked.

Quaker Puffed Wheat (The Quaker Oats Co., Chicago).—It is made from whole wheat; 25 per cent is bran. The minerals are retained. Puffed Wheat with whole milk is approximate in energy value to a dish of hot cooked cereal.

Quaker Oats (The Quaker Oats Co., Chicago).—Brands: Quick Quaker Oats; Rolled Quaker Oats; Mother's Oats; Quick Mother's Oats. Quaker Oats provides 50 per cent more protein than wheat, 60 per cent more than wheat flour, more than twice as much as rice; 100 per cent more than cornmeal. It is rich in minerals and Vitamin B.

Instant Postum (Vacuum Cereal Beverage) (Postum Co., Inc., Battle Creek, Mich.).—A beverage made only of whole wheat and bran roasted with a small portion of sugar-cane molasses. It contains no caffeine.

Postum Cereal (Postum Co., Inc., Battle Creek, Mich.).—It is made only of whole wheat and bran roasted with a small portion of sugar-cane molasses. It contains no caffeine.

Sac-a-Rin Brand of Canned Vegetables (Kings County Packing Co., Oakland, Calif.).—Brands: California Tomatoes; California Asparagus; California Spinach. These are vegetables packed without added salt or sugar for dietetic purposes. For use when an intake of carbohydrate—particularly sugar—is to be restricted.

Sanka Coffee (Sanka Coffee Corporation, Brooklyn and Los Angeles).—A blend of South American coffee with Mocha and Java. The caffeine is removed by a process which removes 97 per cent or more of the caffeine originally present in the bean (based on 1.1 per cent of caffeine). It may be used when other coffee has been forbidden.

Milk Packed Coconut (Franklin Baker) (Franklin Baker Co., Hoboken, N. J.).—The shredded coconut is packed in cans without the addition of sugar, the can being filled with coconut milk.

Franklin Baker Premium Coconut (Franklin Baker Co., Hoboken, N. J.).—The shredded coconut is mixed with added sugar and 5 per cent glycerin and passed through driers.

Southern Style Coconut (Franklin Baker) (Franklin Baker Co., Hoboken, N. J.).—Coconut meat is passed through an automatic shredding machine, after which the added sugar is mixed with the coconut meat, the resultant product being passed through driers. The product is packed in cans in an atmosphere of carbon dioxide.

Hellman's Mayonnaise (Richard Hellman, Inc., Long Island City, N. Y.).—It is made from a blend of edible vegetable oils, vinegar, egg yolk, spices and condiments beaten to a stable emulsion.

Minute Tapioca (Minute Tapioca Co., Inc., Orange, Mass.).—It is made from tapioca flour. The flour is bolted, mixed with water, steam cooked, granulated and dried.

Association of Hawaiian Pineapple Canners.—On the basis of an average of representative samples of Hawaiian pineapples there is obtained a value of 88 calories per hundred grams of canned pineapple. There are better sources of a single vitamin, but as an all around source of vitamins the pineapple takes unusually high rank. Canned pineapple is an article of diet of substantial food value. (Jour. A. M. A., March 8, 1930, p. 716.)

THE PELLAGRA PREVENTIVE ACTION OF CANNED SALMON

In connection with studies relating to the pellagra preventive properties of various food substances the United States Public Health Service has recently announced that canned salmon (Alaska chum) contains the pellagra preventive factor. • By reason of its potency in preventing pellagra and its availability in the preserved state, salmon may be considered a fair substitute for meat in the area of pellagra endemicity where meat is not readily available. The demonstration of the pellagra preventive value of canned salmon furnished further evidence of the soundness of the working hypothesis that black tongue in dogs is the analogue of pellagra in man.

CITRIN NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Citrin is marketed by the Table Rock Laboratories in the form of capsules claimed to contain "50 mgm. cucurbocitrin," the latter being "a non-toxic glucosid-saponin processed from the seed of the watermelon (Cucurbita Citrullus)." In the information submitted to the Council, Citrin is stated to be "the crude extract" obtained from the watermelon seed. The available evidence does not indicate that the product is a pure glucoside. Citrin is stated to be "for the treatment of hypotensive cardio-vascular disease" and is advertised as "The new therapy for vascular hypertension." The Council reviews the available evidence for the usefulness of Citrin and explains that the question at issue seems to be whether the observed lowering of blood pressure by drugs is of any great clinical value, and, when this does occur, to what extent it is due to the drug and to what extent to other factors. Altogether, the Council concludes that the clinical evidence does not establish the therapeutic usefulness of Citrin; hence, the Council declared Citrin unacceptable for New and Non-official Remedies. (Jour. A. M. A., April 5, 1930, p. 1067.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of April 9, 1930

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 9, 1930. Dinner was served at 7 p. m. and the meeting was called to order at 8 p. m. by the President, Dr. Emil S. Geist. There were 52 members present.

Minutes of the March meeting were read and approved; also the minutes of the Executive Committee meeting of March 26th.

Dr. C. D. Freeman read the following memorial to Dr. Paul B. Cook:

Dr. Paul B. Cook, a member of this Academy since 1911, died February 9, 1930, at Miami Beach, Florida, where he had gone to recuperate his health.

He had practiced in St. Paul since his graduation from the University of Minnesota in 1900. He was born in Rochester, Minnesota, the son of George Clinton and Elizabeth Burns Cook. He made his home with his sister, Mrs. F. B. Kellogg, in St. Paul, not having been married.

Dr. Cook was a member of Ramsey County Medical Society, Minnesota Academy of Medicine, Twin City Urological Society, Minnesota Dermatological Society, and the American Urological Association.

Until 1907 he practiced general medicine, when he went to Vienna for a year and did postgraduate work in dermatology and urology, to which specialties he limited his work until his death.

He enlisted early in the last war and after spending several months at Camp Riley and Camp Jackson he was sent to France with the rank of Major in the Medical Corps, where he remained until after the Armistice.

During the last few years of his life Dr. Cook traveled very extensively. He visited South America, Hawaii, took a world cruise, and last year took an extended tour around Africa. Shortly before his last illness he was planning another trip and stated that his only trouble was to find a new place to go.

Dr. Cook is survived by two sisters, Mrs. F. B. Kellogg and Mrs. F. J. Ottis of St. Paul, and a brother, George Cook of Rochester, Minnesota.

Dr. Cook's fine qualities won for him the affection and loyalty of those who knew him well. He was well known by all medical men in this vicinity. As a tribute to him it may be said with no fear of contradiction that he possessed two qualities necessary to every physician: he was honest, he was ethical.

The Committee: S. E. Sweitzer,
F. E. B. Foley,
C. D. Freeman, Chairman.

Dr. A. S. Hamilton read the following memorial to Dr. C. Eugene Riggs:

Dr. C. Eugene Riggs, physician and scholar, educator and original investigator, was born in West Unity, Ohio, in 1853, and died in St. Paul, April 3, 1930. He was descended from an old Maryland family and was attracted to St. Paul, as many other physicians before him, partly by the hope that the vaunted Minnesota climate might heal a suspected pulmonary weakness.

His early education was obtained in the public schools of Ohio, and he later attended Ohio Wesleyan University, where he received the degree of A.B. in 1877, and that of M.A. in 1880. At one time in that period of his life he expected to enter the ministry. He later turned to medicine and his first training was received in the office of his brother, Dr. J. U. Riggs, of Bryan, Ohio. He subsequently had one year in the Medical College at Nashville, Tenn., and was graduated in 1880 at the College of Physicians and Surgeons in Baltimore, Md. After one year as intern at the Women's Hospital, in Baltimore, he came to St. Paul in the spring of 1881 and engaged in the general practice of medicine. Apparently, at this time he had no special interest in diseases of the nervous system and, when, almost immediately on his arrival, he was asked to present a course of lectures on Materia Medica in the St. Paul Medical College, he accepted. Later he was offered the chair of Nervous and Mental Diseases in the same institution, which offer he also accepted, becoming thus the pioneer in Minnesota in the private practice of neurology and psychiatry. When the medical department of the University of Minnesota was established, he was made Professor of Nervous and Mental Diseases and in 1908 became Director of the Department as well as professor. Preparatory to the reorganization, January 15, 1913, he resigned and in June of that year was made Emeritus Professor of Nervous and Mental Diseases, which position he held until his death. Dr. Riggs was an excellent teacher and an inspiring spirit in all his associations with his students and fellow practitioners and to his patients he imparted confidence and courage. He had an unusual knowledge of current literature in his own field and almost to the last day of his life he read his journals, clipped from them the articles which seemed to him especially valuable and put them away in his filing system. Notwithstanding this familiarity with neurologic and psychiatric literature, he once told me that during his years of active teaching he never delivered a lecture to the students without spending the evening preceding in review of the subject matter. But his interests were not limited entirely to clinical fields and on his return from a trip abroad he brought back the equipment for a neuropathological laboratory, the first private neuropathological laboratory in the state; and in this laboratory Dr. L. B. Wilson worked out the histology of Dr. Riggs' case of subacute combined degeneration with pernicious anemia—the first reported in the state and the third reported in this country.

Throughout a long and active career in the practice of medicine, covering forty-nine years, he was a leader in all movements having to do with his specialty. For ten years preceding the establishment of the State Board of Control, Dr. Riggs was Chairman of the State Lunacy Commission. On one of his trips abroad, he was authorized by Governor Merriam to investigate

the insane hospitals of Europe for the purpose of reproducing in Minnesota whatever was of value in European methods of care for the insane. He also interested himself actively in the matter of providing detention wards in our larger cities, in the need of special care for the criminal insane and in the imperative necessity for a voluntary commitment law.

Dr. Riggs was a member of the American Neurological Association, the American Psychiatric Association, the American Medical Association, the Ramsey County Medical Society and the Central Neuropsychiatric Association. He was one of the founders of the Minnesota Academy of Medicine and a past-president of the Academy, and a founder and first president of the Minnesota Neurological Society. He was at one time chairman of the section of Nervous and Mental Diseases of the A. M. A., and was president at one time of the Minnesota State Medical Society.

He was also a member of the Society of Colonial Wars and of the Sons of the Revolution, of which he had been president, and of the Minnesota Club.

Dr. Riggs was a member of the Plymouth Congregational Church of Minneapolis, Past Master of Summit Lodge, a member of Osman Temple and Paladin Commandery, as well as a 32nd Degree Mason.

Dr. Riggs was a very religious man, as one incident of his early career shows. Though he had been offered a position as Chief of the Department of Neurology and Psychiatry in the St. Paul Medical College, the school ceased to exist before he could give his first course of lectures and was merged with the Minneapolis College Hospital in Minneapolis. The meeting for the final settlement of the details of the union and the allocation of titles was held on a Sunday afternoon and Dr. Riggs announced that rather than attend the meeting on Sunday he would renounce his claim for a position on the faculty and he kept his word, but, nevertheless, was given the professorship in his specialty.

Despite his large private practice and his duties as a teacher, Dr. Riggs found time to be a good citizen and to contribute to medical literature some 80 or 90 papers dealing largely with the various phases of neurology and psychiatry. The first article of which I can find any record was published in the Southern Clinic of Richmond, Va., in 1881, under the title "Atresia of the Female Genital Tract," obviously at a time when he had no thought of his ultimate relation to psychiatry. The last article I have found is entitled "Address of Greeting to the American Psychiatric Association" at Minneapolis, June, 1928, published in the American Journal of Psychiatry 1928-1929.

In the intervening period of forty-nine years Dr. Riggs discussed a very wide range of neurologic and psychiatric topics, and though it is hardly proper to detail them here, I may refer specially to two historical articles which are of distinct value in understanding the early medical situation in Minnesota. "Minnesota Medicine in the Making" was published in the State Journal in October, 1921, and the "Reminiscences of a Neurologist" in the same journal of January, 1928.

Perhaps the high point of Dr. Riggs' professional career was reached the night of April 26, 1928, when he was the guest of honor at a dinner tendered him at the Minnesota Club by a group of professional friends.

Of Dr. Riggs' personal character it is less easy to write. To the public, he was the gentleman and the aristocrat. Severe in his principles, he lived his life according to his creed, never deviating from it. He was not one with whom it was easy to make friends, but his friendship, once given, was loyally maintained. One who knew him well has assured me that he never once heard Dr. Riggs utter a profane word, hardly even a slang phrase. As a past-master in the handling of patients, he was well known, but of his kindness, his consideration and his charity to patients, his immediate associates alone were cognizant.

His home life was ideal. On September 11, 1884, he married Mabel Elizabeth Pratt at Bryan, Ohio, and in his wife, to a very unusual degree, he found a companion who shared his ideals, helped him in his labors and enabled him to devote all his energies to the attainment of the very best in his professional life. To the limited friends who were privileged to enjoy it, the hospitality of this household is a happy memory not easily forgotten.

The Committee: W. A. Jones,
E. M. Hammes,
A. S. Hamilton, Chairman.

The scientific program of the evening consisted of two theses.

Dr. E. V. Goltz (St. Paul) read his thesis entitled "Primary Carcinoma of the Lungs and Bronchi."

DISCUSSION

Dr. C. E. Connor (St. Paul): I think that none of us sees enough of this type of case to have a very wide experience; I am sure I haven't. Carcinoma of the lung can modify the normal bronchoscopic picture in either one of two ways: 1. By bronchial pressure with intact mucosa, in which case the bronchoscope is apt to show a stenosis or, if extreme, a complete occlusion. The latter would be rather unusual. 2. By the appearance in the air-way of the tumor itself. These tumors may assume either one of two different types, the fungating, flat, bleeding tumors which suggest malignancy and whose origin is at times determined with difficulty, or the pedunculated papillomatous structure which does not at first suggest carcinoma. The latter, however, is not the type which would give the characteristic clinical picture that Dr. Goltz has described. If the tumor has invaded the air-way, the condition of the bronchial tree will depend a good deal on the size of the tumor. If the tumor is small there will be very little change other than the collection of sanguineous fluid. If the tumor has reached a stage where occlusion is marked, either atelectasis or bronchiectasis may be found.

The bronchoscope does offer a distinct aid in diagnosis and every suspicious case should be bronchoscoped. The results are sometimes surprising. Biopsy

is also important. In the case of the pedunculated papillomatous tumor that is occasionally reported, permanent cure may be obtained, lasting over 5 years. Therapy in the commoner clinical type with various lung changes consists primarily of measures for temporary relief, usually aspiration, which will give the patient considerable relief. Another measure, but one which I have never used, is the implantation of seeds. Deep therapy may be tried, but usually avails little.

Dr. Thomas S. Roberts (Minneapolis): Being called upon, I will speak but I cannot add anything material to this discussion since in some 40 years of practice I have seen only a few cases of carcinoma of the lung and they were not primary in the lung. During a year spent as intern in one of the largest hospitals in Philadelphia there never was a case of primary carcinoma of the lung in the very large number of autopsies that were done there, so far as I can recall. A very considerable number of these were presided over by Dr. William Osler, who never failed to discover and correctly interpret whatever was present.

A case of carcinoma of the lung, though not primary in the lung, seen recently, may be of interest in some of its aspects. A man 66 years of age seemed to be in the best of health until he became greatly depressed mentally (for reasons that were quite sufficient it seemed), when there began a physical decline which was attributed to the state of mind rather than to any disease. He was examined by several physicians, who found nothing definite. After a few weeks there developed a condition which Dr. Sam Sweitzer agreed was probably pellagra of a secondary type. The patient had been eating irregularly and insufficiently, substituting for food a certain amount of alcohol and worrying incessantly, which suggested the possibility of pellagra as an explanation of the unusual skin lesions that appeared on feet, hands and head. Later he developed a moderate cough, some difficulty in swallowing, lost flesh markedly, and still his condition was considered to be largely mental. About this time we went to Rochester and he went through the Clinic, was *x*-rayed, etc., and nothing very definite was discovered, and he came away with the opinion that if he would take a little different view of things he would probably be all right. He did actually gain in weight and made one or two trips to Chicago on business, which looked as though there was not very much the matter with him. Then he began having some pain and distress in the chest and epigastrium. We dined together several times and it was noticed that at the beginning of a meal he seemed to have a little hesitancy in swallowing, with some cough, but then went on and ate his meal without apparent difficulty. As time went on he began to slip back again, had more distress generally, became partially bedridden, and had one or two attacks of sharp pain in the *left* chest. The physical signs were still indefinite. Again we went to Rochester, but before going had a complete set of *x*-rays made here of the chest and abdomen; these showed nothing in the chest but there was apparently some enlargement of the spleen. Another set of pictures was made at the Mayo Clinic and for the first time there was a slight shadow in the *right* lung. There was some difference of opinion as to what this indicated—between an interlobar empyema and a malignant growth. (It is only fair to say that a proposal to make a bronchoscopic examination was declined as the patient's condition at this time was such as to make it seem hardly worth while. It would no doubt have cleared up the uncertainty.) From this time on he was confined to bed mostly, developed a severe cough with offensive sputum, failed rapidly, and died without a positive diagnosis. Dr. E. T. Bell performed an autopsy and found an extensive carcinomatous involvement of the right bronchus, a large abscess in the upper lobe of the right lung, and the esophagus surrounded and partly destroyed by a carcinomatous mass where it came in contact with the involved bronchus. At this point it was densely thickened and indurated, and denuded of the mucous membrane. Through this extensively diseased esophagus, stomach tubes had been passed several times without causing any noticeable distress to the patient, strange as it may seem. It was Dr. Bell's opinion that the carcinoma was primary in the esophagus and secondary in the lung. Other autopsy findings were an enormously enlarged spleen, weighing 1,000 grams, the lower half being the seat of a large metastatic carcinoma measuring 10×12 cm., the central portion necrotic; an open ulcer, 1.2 cm. in diameter, immediately on the gastric side of the pyloric ring; numerous diverticula of the sigmoid, one at least showing acute inflammation; and a moderate grade of cholecystitis with a single small gallstone—certainly a formidable pathological array, and yet this man had comparatively little physical disability until the last few weeks of his life. It was not such a great while before his death that he went to Chicago alone and took care of considerable important business. He must have had this devastating growth developing during the time that we were accusing him of being simply despondent and downhearted. Toward the last, when the mental depression waned almost entirely, about his only complaint was a distress in the region of the stomach and lower chest and he was wont to say, "If I could only get rid of this discomfort I would feel all right."

Dr. C. B. Wright (Minneapolis): How long was the duration of the condition in this man?

Dr. Roberts: I can't say exactly, the onset was so indefinite. He was apparently well until one day something happened to disturb his business relations that depressed him greatly. He went to his summer home in northern Minnesota and sat on the porch most of the time brooding. Early that fall he showed signs of failing, but was not considered seriously sick. He died the following July. Not one of the *x*-rays showed anything suggestive until the last set, about 8 weeks before his death. I imagine he may have had some difficulty in swallowing and perhaps some discomfort that first summer, but he was not a man to complain.

It all goes to show how mortally stricken a man may be and yet how difficult it may be sometimes to find out what is the matter.

Dr. E. K. Geer (St. Paul): I have seen five of these

primary lung carcinomas in the last ten years. The last one is interesting enough to report briefly. A man in his late forties was admitted to Pokegama Sanatorium a year ago with an old bilateral upper lobe tuberculosis. In 1914 he had had an active tuberculosis with positive sputum, and the loss of weight, cough and so forth of which he complained before coming to the sanatorium in 1929 was thought to be a recurrence of his old lung lesion. On the usual sanatorium régime he gained 40 pounds but did not lose his cough. His *x*-ray films on admission showed the old upper lobe tuberculosis and also a shadow at the right root which could have been interpreted as a large gland. About two months ago he complained of dyspnea and on examination an atelectasis of his right lower lobe was found with marked displacement of his heart and mediastinum to the right. Bronchoscopy done by Dr. Greth Gardiner revealed an intrabronchial growth in the right lower bronchus and a section of this growth showed it to be cancer. The lack of characteristic cough, the absence of chest pain, and the suddenness with which it expressed itself clinically were certainly atypical. The other cases I have seen conformed very well to the chief points brought out so clearly by Dr. Goltz.

Inasmuch as physical examination is often disappointing and the *x*-rays films apt to be misleading because so many are reported as "probably inflammatory," it seems to me that from the diagnostic side we will spot this form of cancer much more frequently if we resort to bronchoscopy more often in obscure lesions.

The treatment of primary cancers of the lung has been hopeless in my experience. Deep *x*-ray therapy may prolong life a little but it certainly does not cure.

Dr. Herbert Davis (St. Paul): In how many of those cases did you find tuberculosis?

Dr. Geer: The case I have just mentioned was the only one in which clinically demonstrable tuberculosis in the lung was associated with primary lung cancer.

Dr. S. Marx White (Minneapolis): I wish to call attention to certain sources of error in diagnosis common when carcinoma is developing in the lung. I have been in a position to see a fair number of cases during many years' service at the University Hospital in our work in the Clinic. A case occurring in a well-known internist in Cleveland about two years ago illustrates one of the sources of difficulty. This physician, whose name would be familiar to everyone here, had, with an insidious onset, a suppurative process in the left interlobar fissure. This process required drainage but, because it covered up the primary process, the diagnosis of carcinoma could not be made at first but subsequent developments made that diagnosis clear. I have seen such suppurative interlobar processes in carcinoma and they are a serious element of confusion.

A more common cause for difficulty in diagnosis is in the differentiation from pulmonary tuberculosis, particularly when the carcinoma develops in an upper lobe; the *x*-ray shadow may be that of a pyramid of greater density than normal, the apex toward the hilus of the lung. With the tendency on the part of the roentgenologist to report such shadows as tuberculosis, even in the absence of such phenomena as cavitation or other processes which are highly significant of a destructive process like tuberculosis, the roentgen diagnosis is given greater value than it deserves and the clinician is likely to accept the diagnosis as final when it should be taken only as a part of the whole picture.

A third difficulty lies in the fact that with carcinoma of the lower lobe pleural effusion very frequently occurs. The effusion masks the infiltrative processes in the lung and there is nothing in the *x*-ray picture, therefore, to suggest an intrapulmonary process. The frequent occurrence of blood in such effusions is suggestive and often helpful in calling to mind the possibility of carcinoma. The fact that pain is also usually a predominant symptom in carcinoma adds another suggestive point.

Dr. Goltz's paper is a very helpful contribution to a subject of great importance and it is clear that carcinoma of the lung, while it has certain features highly suggestive from the clinical standpoint, is liable to simulate a number of conditions, and unless we think of it as a possibility in all cases, especially with people in the cancer age, we can easily miss the diagnosis.

Dr. C. N. Spratt (Minneapolis): In an abstract of an article on tobacco and tobacco-smoke as a factor in cancer, in the Journal of the A. M. A. for March 29, 1930, Lickint reviews over 4,000 cases of cancer of the bronchi and lungs from the literature. He finds this five times more common in men than in women. He believes "that this is to be explained in part by the great increase in cigaret smoking, with its attendant inhalation. Not only smokers but non-smokers are exposed to this danger in smoke-filled rooms. Because of the finer state of division of the particles in tobacco smoke, they have a much greater penetrating power than have particles of dust. In the case of tobacco smoke, the maximum amount of irritation is produced because, in addition to the mechanical irritation (particles of carbon), there is also a chemical (tarlike combustible products) and a thermal (current of heated air) irritation."

According to Dr. Henry W. Cook, in an address delivered at a convention of life insurance presidents in December, 1929, the expectance of life has not increased except in the first two years, and no appreciable gain is shown after the age of 50, "and a very marked loss is shown in several very important diseases such as heart disease—now the largest single mortality factor—in cancer, in diabetes, and in death from automobile accidents. In other words, while a baby born today has an increase in life expectancy of 17 years, an adult of 50 or over has no increased expectancy in comparison with 50 years ago, and probably even in comparison with 2,500 years ago, in the days of Pericles."

Dr. Bloodgood has called attention to the fact that cancer of the lip is more common in men than in women, and has brought up the question of its increased frequency in the latter as smoking becomes more common among them.

Dr. A. R. Hall (St. Paul): One of the interesting things brought out by the essayist is the increase of carcinoma of the lung. The essayist states that this is a real increase as is shown by autopsy statistics. Au-

topsies are probably not much better done today than they were 25 years ago; what I mean is that carcinoma of the lung would not have been much more likely to have been missed in an autopsy 25 years ago than it is today, and yet statistics from different countries of the world show that, whereas the primary seat of all carcinomas 25 years ago was found to be in the lung in about 1 or 2 per cent of cases, today in all carcinomas the primary seat is found in the lung in about two to three times this percentage. The statistics from the different hospitals in different countries are fairly uniform in this increase. It is interesting to speculate as to what the cause of this increase may be. It must be some world-wide cause. As Dr. Goltz has stated, many different things have been considered that might be a causative factor. The one lung irritant which has been suggested and which would seem to fill the requirement of being world-wide is influenza.

As to diagnosis, the most important thing is that we do not forget that there is such a thing as carcinoma of the lung. It seems to me that pain is more often present in carcinoma of the lung than it is in other obscure lung conditions.

In the way of treatment, deep *x*-ray therapy, while it does not cure, does seem to slow up the process.

Dr. L. C. Bacon (St. Paul): My excuse for prolonging the discussion is that this thesis is a timely and valuable one and is entitled to free discussion. The matter of treatment has not been touched upon. At the present time deep roentgen ray therapy is the only method of treatment which gives promise of possible benefit and even with this we are not hopeful. I have come in contact with two casces of lung carcinoma and the result in one of them indicates that deep therapy should be resorted to vigorously.

The first was a woman of 58 years, slender and small, with a carcinoma of the right breast which was removed by radical operation. She returned in a few months with a metastasis involving the right lung, lower and middle lobes. Deep roentgen ray treatment was vigorous and after a stormy period of about three months, during which she expectorated quantities of pus and fibrous tissue, she regained a fair degree of health and lived three years, finally dying from an influenza. Autopsy disclosed complete destruction of the right lung with collapsed thorax completely filled by the remaining thoracic structures. No carcinomatous tissue could be found.

The second case, a large stout woman, 62 years of age, had been in the University Hospital with a diagnosis of carcinoma of the right lung. She had been treated with *x*-ray until she had refused further treatment and returned home. I came into the case only a few days before her death. Autopsy disclosed complete destruction of the right lung and metastases in the liver and left kidney confirmed the diagnosis. Pleuritic fluid was present and the chest wall had not collapsed. She gave a history of repeated drainage of the pleuritic fluid and I drained it once during my charge. She apparently died from exhaustion.

One case living in comfort for three years should admonish us to give these very hopeless cases the possible benefit of *x*-ray.

Dr. Goltz (in closing): I have nothing more to add, but wish to thank the members for the discussion of my paper. I think the important thing to gather from this paper and from the discussions is that one should bear this condition in mind in all obscure chest conditions.

Dr. Emil C. Robitshek (Minneapolis) read his thesis entitled "Acute Perforated Peptic Ulcer."

DISCUSSION

Dr. E. M. Jones (St. Paul): The hour is late but I have some interesting plates I wish to show. The patient, a young man 21 years of age, was admitted to the Ancker Hospital at 8:30 a. m. March 22, 1930. He states that the night before admission he became nauseated and vomited. He retired but was awakened at 4 a. m. by a violent pain in his upper abdomen. He took some soda and the pain became worse. A doctor was called and he was sent to the hospital. On admission he was seen by Dr. Colvin. The man was having severe pain in the upper abdomen. The abdomen was rigid but not the so-called board-like abdomen. Temperature 98°, pulse 80, leukocytes 10,000. The most probable diagnosis was cholecystic disease or perforated ulcer. An hour after admission the picture had entirely changed. He was having no pain and only a slight muscular rigidity in the upper right quadrant of the abdomen. It was decided to treat him expectantly. An *x*-ray plate of the abdomen was ordered and it showed air between the liver and diaphragm. I saw the man again in the afternoon and his condition was the same, with the exception of a temperature rise to 101°. In view of the *x*-ray findings, there was no question as to the diagnosis of a perforated viscus. Five per cent of perforated ulcers are sealed locally and do not develop general abdominal symptoms. Another picture was taken and the air bubble was again demonstrated above the liver. In spite of the patient's good condition, but because of the *x*-ray findings I finally advised operation, but the patient would not consent. Later in the evening he was again seen and his condition was so satisfactory that I decided to continue the expectant treatment.

Cases of perforated ulcer often show apparent improvement after a few hours but then the symptoms of general peritonitis begin to develop and this of course is the reason for early operation. This patient, however, was continually improving and nothing developed pointing to a general peritoneal involvement and we felt these symptoms would have developed by evening as it was 14 hours after the onset.

On the seventh day a picture was taken showing that the air had disappeared, and on the ninth day some barium was given and a duodenal ulcer was demonstrated. I am not advocating the non-surgical treatment of these cases but I do not believe any one watching this man would have operated upon him before we had these *x*-ray pictures.

I think a case like this impresses us with the fact that we must carefully evaluate our clinical symptoms.

Dr. Alex R. Colvin (St. Paul): First of all I would

like to congratulate the essayist on his paper. It is very valuable because of the comprehensive and yet concise statement of the views of those who have large experience in the subject just presented by Dr. Robitshek.

Regarding the case reported by Dr. Jones, I saw this man when he first entered the hospital and the question then seemed not "has he a perforated ulcer?" but "has he a perforating one?" The patient said he had had very severe pain, but at the time of examination he had very little. He had some rigidity but not a board-like rigidity. Whether or not he should have been operated on may be a debatable question. I do not think it would have been a mistake to operate. Certainly the free air above the liver seemed a positive indication, but then clinically he was getting well.

Regarding the number of times an ulcer may perforate, I operated twice in one year for perforation of the same ulcer. At the first operation 10 hours after perforation a simple closure was done; at the second perforation about a year later a suture and gastro-enterostomy was done 6 hours after perforation. He still has some residual symptoms.

Regarding the time that has elapsed after perforation and recovery still be possible, fifteen years ago I saw a young man 36 hours after perforation with all of the symptoms of apparently fatal peritonitis. It seemed hopeless to resort to surgery; this was, however, done, with only closure of the perforation. On opening the peritoneal cavity there was a regular gush of air and fluid. Drains were used but with practically no drainage. He has remained free from symptoms since. So that the result in Dr. Jones' case can be understood; the perforation became sealed off and the peritoneum took care of the infection just as it did in my case of 36 hours' perforation with much more extravasated material still to be taken care of after the perforation was closed by operation.

The diagnosis of an acute perforation is usually obvious. I recall one case where, after a midnight examination, the night supervisor, an experienced Sister, wishing to know what action to take, remarked, "A very sick man, doctor?" "Yes." "An ulcer?" "Yes." "Perforation?" "Yes." "Operation?" "Yes." The general behavior, combined with the board-like rigidity were quite familiar to her. In Dr. Jones' case the picture was not at all so striking and doubt might well be entertained; the radiograph was of striking assistance.

In regard to the incidence of ulcer in Scotland. There are two things that made Scotland famous—whisky and the Bible. Whisky has been given as one of the causes of ulcer. I am not sure whether the reason the Scotch have more ulcers perforate is due to whisky or to economy in the employment of medical assistance.

Dr. C. B. Wright (Minneapolis): Acute perforated peptic ulcer is a surgical condition and should have surgical consideration as quickly as possible. Unfortunately, however, these cases are more often first seen by men with little experience either in the diagnosis or treatment. The reason for this is that perforated ulcers are rare. I have repeatedly heard men in general practice for many years say they have never seen one and it is exceptional to find men, outside of large emergency hospitals, who have seen many of these cases. Forty-three cases at the Minneapolis General Hospital over a period of 10 years and operated on by various surgeons is not a large group when one considers that the Minneapolis General is one of the largest emergency hospitals in the Northwest.

I have seen 9 cases in 27 years of practice. The first was the rarer type of perforated ulcer; that is, a large perforation on the anterior wall. This patient was a young, healthy servant girl without previous symptoms of ulcer, who, after eating a hearty breakfast, collapsed on the stairs and had to be carried to bed. I saw her almost immediately and found her in shock; by that I mean pale, cold perspiration, with a small rapid pulse, and complaining of violent pains in her right lower quadrant. She had vomited, but had not vomited blood. She had dullness in both flanks, generalized abdominal pains with marked rigidity and I felt that she might have a ruptured extra-uterine. She was operated in 2 hours. A large meal consisting of meat, potatoes and bread, was found in her abdominal cavity and a perforation in the anterior wall of her stomach the size of a dollar. Sewing up the opening with a purse-string suture and reinforcing it with mattress-sutures, washing her breakfast out of her abdominal cavity with salt solution was followed by recovery. Her convalescence was complicated by infection of the abdominal wall, right-sided pneumonia, and phlebitis. I saw her 25 years later; she has never had any stomach trouble since and nothing could be found by fluoroscopic examination.

There were two other cases of stomach perforation, one a slow perforating ulcer on the anterior curvature, which was readily diagnosed but refused operation and died a few days later at home of a general peritonitis. A third case was in a young woman where the ulcer perforated into the lesser peritoneum and was cured by draining a large abscess some time later.

I have seen 6 duodenal ulcer perforations. One of these cases had been treated by Osler in 1903 for a dilated stomach; later by Sippy. He was finally operated on by Theodor Bratrud for a sudden perforation, with apparently complete recovery, but died 3 years later of a gastric hemorrhage. Two other cases were not seen until 16 hours after perforation had occurred; both had fairly large perforations and died of general peritonitis after the operation. Another case recovered following an operation for perforation of the duodenum by simply closing the ulcer. He later had several attacks of hemorrhage and died 6 years after the operation in a convulsion. This patient refused hospitalization until the very last, after a long period of vomiting, and died from what apparently was gastric tetany. At autopsy he showed a tremendously dilated stomach, apparently without obstruction because one could easily put two fingers through the pylorus. Two others are living, one 10 and one 20 years after the operation, both having had recurring attacks of ulcer trouble. I have never seen a case of ulcer perforate under any kind of proper medical management. However, cases

have been observed by others. It must be a very infrequent happening.

A previous history of ulcer does not helps us, as the history is difficult to obtain and statistics will show that only about 50 per cent of these cases have had a previous history of ulcer.

Accuracy in the recognition of a surgical abdomen can, in the last analysis, only be determined by the care in the examination of the abdomen and the amount of experience of the examiner. There should be no delay in an attempt to make a refined laboratory diagnosis in these emergency cases and the method of treatment should be determined by the conditions which are present.

My own experience leads me to believe that cases of chronic ulcer in which there has been hemorrhage, penetration, or perforation, should be kept under observation and treated for long periods of time; the longer the better, and by treatment I do not mean milk and powders alone. More important are general hygienic measures such as careful living with plenty of rest and a well-balanced bland diet which contains sufficient vitamins.

Dr. J. T. Christison (St. Paul): It is not my intention to discuss so valuable a surgical paper, but I would like to call the attention of the Academy to the fact that perforating ulcers occur in children not infrequently. I have seen three of them. One was sent into the hospital with a diagnosis of acute appendicitis, another of intussusception, and another of pneumonia. Death occurred in all three, and autopsies were had. Two of them had a perforated ulcer on the posterior wall of the stomach at the pyloric end, and the other had a perforation on the anterior wall about the middle of the stomach.

We must not lose sight of the fact that even in very young babies ulcers do occasionally develop. One of these babies was 9 months, one 11 months, and the other 14 months.

Dr. Robitshek (in closing): I have nothing to add, but wish to thank the members for the very kind reception they have accorded my effort and to thank them as well for their discussions.

The meeting adjourned.

R. T. LaVake, M.D.
Secretary.

EPHEDROL WITH ETHYLMORPHINE HYDROCHLORIDE (LILLY) NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that this is a shotgun cough mixture, relying on an opiate for its effect, and on the vogue of ephedrine for sales-appeal. The Council declared Ephedrol with Ethylmorphine Hydrochloride unacceptable for New and Non-official Remedies because it is an unscientific mixture marketed under an unacceptable proprietary name with unwarranted therapeutic claims. (Jour. A. M. A., March 1, 1930, p. 634.)

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

Stated meeting held March 6, 1930
The President, Dr. S. R. Maxeiner, Presiding.

The meeting was held at the Minneapolis General Hospital and was devoted to clinical case reports presented in the following order:

1. Case reports by Dr. E. A. Regnier.
2. Case reports by Dr. A. A. Zierold.
3. Case reports by Dr. O. J. Campbell.
4. Case reports by Dr. T. H. Sweetser.
5. Remarks by Dr. A. R. Colvin.
6. Remarks by Dr. R. C. Webb.
7. Remarks by Dr. H. B. Sweetser.

Dr. E. A. Regnier: I wish to first present two cases of intracapsular fractures in the neck of the femur. I present these cases, not because of any unusual pathology, but to bring out a few important points in the treatment of this type of fracture.

Case 1.—Female, aged 44, came to the hospital for treatment last August, complaining of pain in the hip, following a fall. Previous history unimportant. (Series of *x*-ray plates shown.) This is a transverse intracapsular fracture of the neck of the femur. Treatment—double plaster spica. You can see from these plates that the anatomical position is good. There is a maximum amount of internal rotation and abduction, which is all-important in this type of fracture. The pictures also show a severe degree of bony absorption, resulting from prolonged encasement in plaster. The plaster in this case was left on for fourteen weeks. Subsequently the patient received physiotherapy, and is now going to be equipped with walking calipers, which we recommend for all of these cases.

Case 2.—This case is practically identical with the previous one, but the treatment was slightly different. The patient was put up in a Thomas Splint in abduction, and as you see from the *x*-ray plate the position was anatomically nearly perfect. Two months later the patient complained of pain in the hip joint. *X*-ray was taken and showed complete displacement of the fracture. This had taken place and the cause was unknown. The patient was then put in a plaster spica, and bony union was obtained after sixteen weeks. She now has excellent functional result and very little shortening. I present this case merely to point out that the treatment of hip fractures is fraught with pitfalls and accidents, and to show the many possibilities that may interfere, and militate against good end-results. We are pretty well committed to the Whitman method of treatment of hip fractures, for the following reasons: it assures against displacement once the cast is applied; it will maintain the fragments in whatever position they may have been reduced; it will assure bony union in a greater percentage of cases than any other conservative method of treatment; it is the only method that can maintain the proper degree of internal rotation, which is necessary in this type of case. It is

not ideal because the prolonged encasement in plaster produces atrophic changes.

We have been using double spica casts in the majority of our cases, because this fixes the pelvis more securely and prevents tilting, and also facilitates moving the patient with less discomfort. The excellent position of the fragments, shown in case two, with subsequent displacement emphasizes the need of frequent *x*-rays, and the greater safety in using the Whitman method of treatment. We recommend a walking caliper for all cases of this kind for a period of two to six months, following bed treatment. It is essential that calipers be carefully measured, for if not properly fitted there will result a coxa vara from too early weight bearing. Non-union is rare by this method of treatment. In fact one case, and the only case in this hospital in the last five years, obtained a firm bony union after eighteen months in a walking caliper.

Case 3.—I want to show this case as an example of a fracture into the knee joint, with an excellent functional recovery, and a very good anatomical result. This man sustained a comminuted fracture of the upper third of the tibia with three definite fracture lines extending into the articular surface of the tibia. He had about three inches shortening. He was treated by the use of skeletal traction; that is, a Steinman pin was put through the os calcis and extension applied for a period of three weeks, during which time the knee joint was frequently flexed. He now has 75 per cent normal motion in the knee joint, and has no shortening, and can do the same work he did before his accident. The important point to stress in the treatment of fractures extending into the knee joint is early motion to prevent ankylosis of the joint.

Case 4.—I wish to show this case as a splendid example of the good results which can be obtained in traumatic surgery by conservative measures, where modern facilities are available. On October 8th a truck backed into this man. He sustained a fracture of the lower third of the right femur, a crushing fracture of the first lumbar vertebra, and a fracture through the acetabulum on the opposite side. Traction was applied to the right femur by the use of calipers for a period of two weeks. At this time the position was very good. Calipers were removed, and soft tissue traction was applied below the knee for a period of five weeks. The other extremity was placed in a Thomas splint with ten pounds of traction for a period of four weeks. The extremity was mobilized each day. (Series of *x*-ray plates shown.) Patient was placed on a Bradford frame in hyperextension, the angle of extension being directly over the first lumbar vertebra. He now has no demonstrable shortening of either extremity. He has no pain in his back whatever, and is perfectly comfortable. He is just beginning to walk around, and we are not urging him to walk a great deal at present. He is getting physiotherapy, and is being treated for diabetes and syphilis. The results, which you see from these plates, are worthy of note, in view of the fact that the man is a diabetic and has had syphilis for twenty years. We do not believe that syphilis plays any important role in the healing of fractures. We believe that the majority of fractures through the lower third of the femur are best handled by the use of skeletal traction. The pull is more positive, requires less weight, and allows for complete mobilization of the joints above and below the point of fracture. Likewise the use of the Thomas Splint for fractures through the acetabulum allows full motion at the hip joint, as to flexion, rotation and abduction. This is particularly important in preventing ankylosis of the hip joint. In crushing fractures of the vertebræ where there is no evidence of paralysis, we believe that complete immobilization on a Bradford frame, with hyperextension of the spine at the point of fracture gives very satisfactory results.

DR. O. J. CAMPBELL presented the following cases:

Case 1.—The first patient, whom I wish to show, is a man, fifty-nine years of age, who, last October, sustained an intertrochanteric fracture of the left hip. He is of interest only because of the unusual accuracy of the reduction. Buck's extension, with slight abduction, was used from the first and maintained for twelve weeks. For the past five or six weeks there has been no apparatus used, the patient being kept in bed and sent daily to the physiotherapy department. He now has a good range of motion in his hip and is ready to walk with a crutch or upon walking calipers. Only the closest inspection of the film would enable one to detect the fracture line.

Case 2.—The next patient is a boy of eleven years whose right foot had been crushed by a train. The toes were amputated or hanging by shreds of tissue. The skin of the dorsum and the sole of the foot had been completely avulsed. As you can see, in the film, the metatarsals have all been fractured and driven through the sole. The navicular and first cuneiform bones have been displaced laterally. Upon first examination it seemed that nothing short of an amputation would avail. Amputation is particularly unfortunate in a child because of the attendant retardation of growth of the involved extremity. Accordingly a thorough debridement of the foot was done. The toes were removed and the fractures reduced as well as possible. Dakin's tubes were placed in and about the wound and irrigations were started immediately. Serious infection did not occur and after a week his fever returned to normal. We were unable to prevent the development of marked foot drop.

Last week we skin grafted the unhealed areas, using a number of implantation grafts. We did this to get rid of all infection. The next step will be to lengthen the Achilles tendon and get the foot into a good position, following which, it is planned to swing the foot to the opposite thigh and by means of a pedicle flap, give him a fatty pad over the ends of the metatarsals. Finally a steel brace and arch support can be fitted.

We are not too optimistic but if the patient can get a foot which will bear weight, without pain, we can prevent, to a large degree, serious retardation of

growth. In a child of his age the effort does seem worth while.

Case 3.—This fracture of the left humerus was sustained in September of last year. The patient was put to bed and the arm was extended with the forearm flexed to ninety degrees. Extension was maintained for eight weeks and he was discharged with a fair and seemingly adequate callus. After two months he returned with obvious delayed union. The man was anxious to get back to work and the degree of motion at the fracture line was such as to make us feel that, even with a long period of immobilization, union would not occur. As you see on the film there has been a long free fragment. This fragment is firmly united to the proximal shaft. There is no union between the fragment and distal part of the shaft. He was operated upon and very dense scar tissue between the fragments was excised. The ends were freshened and a Parham band was applied around the united free fragment and the distal portion of the shaft. Bone chips were placed in the fracture line and around it. He now has good callus formation. As it is too early to allow him to go without some fixation, we have applied the plaster cast which you see. This cast firmly applied to thorax and shoulder, and maintaining the arm in slight abduction, is the best method we know to immobilize the humerus.

There is a complication of interest. He has a radial nerve palsy. The nerve was intact at operation and the greatest care was exercised in protecting it from injury. Considerable manipulation was necessary and it is believed that there was enough tension put on the nerve to bring about this condition. Sensation has returned but not muscular activity. We know that the nerve is intact and feel satisfied that he will, eventually, get full reurn of function.

Case 4.—This patient is forty-six years of age and was brought into the hospital two weeks ago, completely under the influence of alcohol. He had been found in the neighborhood, with a broken ankle and abrasions about the face.

Twelve hours after admission, the patient failing to void, catheterization was done and 900 c.c. of bloody urine removed. Two hours later 1,300 c.c. was obtained. I saw the patient the next morning, twenty-four hours after admission. The effect of the alcohol had worn off. At this time he had a rigid abdomen, temperature of 99.2 and leukocytosis of 10,000. Catherization again revealed a distended bladder and this time the catheter was retained and fastened in place.

The first diagnosis which suggested itself was ruptured bladder with developing peritonitis. The fact that the bladder had been found distended on several occasions seemed very much against this. Peritonitis from a ruptured viscus was considered unlikely, because of the mildness of his febrile reaction, the low leukocytosis and the absence of gas in the abdomen as demonstrated in the *x*-ray. A diagnosis of intra- or retroabdominal hemorrhage was made. In view of the length of time after the accident (probably about thirty-six hours) and the fact that the patient was improving, it was decided not to operate.

The patient improved steadily for five days. The urine became clear, in spite of which the catheter was retained in the bladder. Gradually he showed signs of paralytic ileus. Extreme distension followed. For a time we succeeded in getting gas through by means of Noble's enemas and pituitrin. He continued to vomit, the blood chlorides dropped to 429, his pulse and temperature rose slightly. On the eighth day, other means failing, we gave him a spinal anesthetic. While under the influence of the anesthesia, pituitrin was given and enormous quantities of gas were expelled. He improved rapidly after this. A daily injection of pituitrin was sufficient to keep him flaccid. He is now getting almost a full diet, and, as you can see, his abdomen is entirely soft and flat. His leukocyte count has never gone above 12,000 and has now dropped to 10,800.

Of interest is the large quantity of fluid needed to maintain his balance during the time he was vomiting so profusely. In one period of twenty-fours he was given 10,500 c.c. of normal salt solution by hypodermoclysis and 1,500 c.c. of 10 per cent glucose intravenously.

The question is—has this man had a perforated bladder. Cystoscopy was done about the fifth day and a small break in the bladder mucosa about 2 mm. long was described. We do not know whether this went through the bladder wall, but it was obviously the source of the hematuria, as the kidney shadows in the *x*-ray had been normal and there was at no time tenderness over the kidneys.

It is our impression that this man has had intra- or retroabdominal hemorrhage, giving him peritoneal irritation and later paralytic ileus.

Dr. Theodore H. Sweetser presented two cases:

Case 1.—As a corollary to my paper read at the November meeting, this patient, who is recovering from an operation for urinary extravasation, is presented to show the remarkable healing properties of the scrotum. As soon as the diagnosis was made, operation was performed—perineal urethrotomy with perineal drainage of bladder, very extensive incision for drainage consisting of bisection of the scrotum and trimming away of all necrotic tissue, and internal urethrotomy of the anterior urethra. The perineal urethrotomy wound has healed. The scrotal wound has shrunk remarkably and is almost covered with skin. Occasional passage of sounds will be needed to be sure of maintaining the full size of the anterior urethra.

Case 2.—A man twenty years old was admitted to the General Hospital in October, 1929, complaining of frequent burning urination, pain in the lower abdomen, and pyuria which had persisted in spite of treatment for gonorrhea for over a year. Physical examination was negative. Urine was of low fixed specific gravity, and showed pus and at times a few blood cells. P.S.P. tests and blood chemistry showed a very severe renal

insufficiency. After careful study on the medical service I was asked to examine him cystoscopically.

The bladder appeared normal, and the only clue to the diagnosis lay in the right pyeloureterogram. The moth-eaten pyelogram with extensions into the renal cortex and the irregularly dilated ureter were strongly suggestive of tuberculosis.

Although tubercle bacilli were not found in the urine at or even just after this cystoscopy, and the guinea pig inoculated with the urine obtained at cystoscopy failed to develop the disease, still one bacillus was found in the urine a week after the cystoscopy, and organisms have been found repeatedly since, though not in all specimens.

A second cystoscopy was done nine days after the first; there were at that time a few minute nodules in the musosa just below each ureteral orifice. The left pyeloureterogram shows filling defects, extensions into the renal cortex, and a marked irregular dilatation of the ureter.

The diagnosis, then, was definitely bilateral tuberculosis of kidneys and ureters with minimal involvement of the bladder. He was sent to the Glen Lake Sanatorium, where he now is.

From this case we learn that a diagnosis of renal tuberculosis may be difficult even with every facility at hand for its determination. Also we are warned that we should search for some reason, when a case does not respond to treatment in a reasonable time. This man may have had gonorrhea in July, 1928, but surely tuberculosis was the cause of his pyuria and urinary symptoms long before October, 1929.

DR. A. R. COLVIN: I didn't have the remotest idea of coming over here to discuss anything. I received a very kind message to come and attend a clinical meeting and I have enjoyed it immensely. The thing that has impressed me here all evening has been the eminently conservative manner of treatment and the good results. That knee case that was shown a short time ago was an evidence of the careful persistent keeping after a fracture which is so necessary in the treatment of fractures.

Before saying anything about fractures, I would like to recite a little experience with urinary extravasation, which is always a most interesting subject. As a third year student, I went out into the Alberta prairies to take the practice of another physician and just before he left he opened an abscess in a man's scrotum. The patient came back a short time later and I was horrified to find that the man was passing urine through his abscess opening. I had had then no experience along this line, but it happened that the physician whose place I was taking had a very good library and in looking through the literature I found a very valuable article by Sir Henry Thompson. One of the conditions that he referred to was a condition of multiple sinuses of the scrotum as a result of extravasation of urine due to stricture. These cases, when neglected, present themselves with multiple sinuses and when the patient urinates urine is passed through these various sinuses. Sir Henry Thompson in describing this condition called it a "watering pot scrotum." My patient had evidently a stricture of large caliber behind which developed a periurethral abscess and a consequent extravasation of urine. I was fortunate enough to be able to pass a catheter into the bladder and in this way the urethral fistula closed. However, perineal section is usually required and always in the old neglected cases.

Another case which I remember very clearly is that of a patient who had lost the entire scrotal skin and almost the entire skin of the penis as a result of cellulitis of the scrotum. The skin is, however, usually not entirely lost. After a certain amount of destruction has taken place the remaining skin retracts up around the root of the penis. After a healthy condition of granulations has been established, the skin is gradually pulled down again and in a surprisingly short time the scrotum and penis become again covered with skin.

The thought that occurred to me about fractures as I listened to these cases was that I wondered why the Society hadn't spent more time discussing fractures of the neck of the femur. It seems to me that with the talent you have here you could discuss that subject for a long time. The case that interested me most was the case of the woman who walked in here whose *x*-ray pictures showed a great deal of absorption of the neck and still she had an excellent functional result. I have at present a patient whose subcapital fracture I put up in the approved Whitman position. I have *x*-ray pictures taken at about the end of the month showing absolute anatomical position. You can hardly tell there has been a fracture. A picture taken at the end of three months showed almost complete disappearance of the neck. There seems to be a growing conviction that absorption of the neck does occur even in the presence of correct treatment. Lorenz insists, however, that before we accept the condition of absorption in any given case we must be sure that we have correct and maintained reduction. It will thus be important, where our radiographs show good reduction, that we assure ourselves by frequent pictures that this is maintained. Provided that absorption has occurred is there still any chance of union? Speed, of Chicago, writing of nonuniting fractures of the neck insists on remanipulation and again putting up in a cast for a long time. Inasmuch as just in these cases of complete absorption reconstruction operations are less satisfactory it becomes important to follow Speed's advice. Anschutz, reviewing at great length in "Die Engebnisse der Chirurgie and Orthopoedie" the whole subject of fractures of the neck of the femur, acknowledges Whitman's method as the correct manner of treatment. He also cites cases with illustrations where prolonged treatment in cases with absorption of the neck has resulted in good functional result and in the radiograph shows a stable structural result.

It would seem important therefore to lay stress upon the persistent and continued treatment of the neck of the femur even in the presence of delayed union.

Dr. H. B. Sweetser: My experience goes back to before the day of the *x*-ray, when we were obliged to depend entirely on clinical methods for diagnosis and a check-up on the results of treatment; and the results frequently left much to be desired. I was therefore very much interested in this series of *x*-ray plates, showing the position of the fragments before and after reduction, and, at intervals afterwards, whether reduction has been maintained, and if the progress made in ossification is satisfactory.

The *x*-ray and improved refinement in aseptic technic have aided immensely in the management of fractures and in the results attained.

Up to twenty years ago intracapsular fracture of the femur doomed the patient to non-uion and consequent loss of power to walk in almost one hundred per cent of the cases; today, by the Whitman method or by bone pegging, we may hope for union in a large proportion of the cases. In fractures entering a large joint, when the roentgenogram shows that the fragments cannot be put and held in perfect alignment, we no longer hesitate to open the joint and nail the fragments in their exact absolute relationship to each other.

The business meeting of the Society was held immediately following the program.

The election of officers for the ensuing year was held with nominations from the floor as no preliminary nominating committee had been appointed.

For the presidency the name of Dr. E. T. Green was presented by Dr. S. H. Baxter with a second nomination of Dr. A. T. Mann by Dr. E. A. Regnier. Dr. Mann was elected by a vote of 7 to 6.

For vice-president Dr. Theodore Sweetser was nominated and unanimously elected.

Dr. H. O. McPheeters was continued as secretary-treasurer, having been elected a year ago for a period of three years.

Dr. J. M. Hayes was re-elected to the council for a five-year term and Dr. Owen Wangensteen was elected to fill the unexpired term of Dr. Theodore Sweetser.

Drs. Tom Kinsella, O. J. Campbell, and R. P. Caron were elected to membership in the society.

There was a general discussion as to enlarging the membership of the society and whether or not surgical specialists might be included. The final decision was to continue as in the past, restricting membership to those who do only "general surgery" as was the idea when the organization formed.

The meeting adjourned at 10:30 P. M.

H. O. McPheeters, M.D.
Secretary.

Stated meeting held May 1, 1930
The President, Dr. S. R. Maxeiner, Presiding.

The Minneapolis Surgical Society met Thursday evening, May 1, at the home of the president, Dr. S. R. Maxeiner.

The society offers two prizes each year for the best thesis on the subject of clinical surgery. The essays this year were of an unusually high standard and quality and the competition was more keen than ever. Essays winning first and second awards were read at this meeting.

The essay winning first prize was written by Mr. Charles Rea, a senior in the University of Minnesota Medical School, on the subject of "Malignancy of the Undescended Testicle." This showed a large amount of original research work combined with a most complete and thorough résumé of the literature on this subject. It was a most valuable contribution to the profession.

The second prize was won by Dr. Evelyn G. McLane of Sleepy Eye, Minnesota. Dr. McLane made a complete résumé of all goiter cases which had been operated on at the New Asbury Hospital during the past five years. This brought out many very interesting facts and showed that the mortality rate at one of the best private hospitals was equal to that of the best clinics in the country.

The retiring president, Dr. S. R. Maxeiner, gave the address of the evening. This was on "Constructive Criticism for the Society." The work of the year was reviewed generally and plans outlined for the coming year.

CONSTRUCTIVE CRITICISM

Stanley R. Maxeiner, M.D., F.A.C.S.

Mr. Chairman and Members of the Minneapolis Surgical Society:

Permit me to thank you for the honor which was conferred upon me when you elected me to your presidency. I also wish to thank you for your coöperation throughout the year as I fully realize that what success has been attained could not have been effected otherwise. Especially deserving of thanks are those members who have furnished the programs, those who have served on the Council, and, most of all, our efficient secretary, Doctor McPheeters, whose efforts have been untiring and spontaneous. I shall attempt to follow the precedent established by our last two past presidents by furnishing constructive remarks relative to the past and future of our society.

During the past year we have had eight meetings as usual and one excellent clinic. With an active membership of 36, we have had an average attendance of 18, or 50 per cent, which compares favorably with that of other organizations to which I belong. Two candidates have not given their initiation theses within the time limit and, as a result, have not become members. Several members have not been especially active, while three new members have been elected and several other applications have been received. Although this society is still very young, we are building our reputation and I sincerely hope that in the near future it will be such an honor to be within its folds that every surgeon in Minneapolis will feel that he can ill afford not to belong.

Repeatedly discussion has occurred relative to including members of other branches of surgery, such as orthopedics, gynecology and urology, among our eligibles, but to date no action has been taken. The writer believes that the increase in members would be small but that many benefits might follow, from contact between our general surgeons and representatives of

these specialities. It is of such importance that it could well be given adequate time for ample discussion and final settlement.

At the suggestion of Doctor Webb, a suitable seal has been adopted and, as you have noted, has been used as a letterhead. This custom has been followed by other societies and lends certain dignity to our correspondence and notices.

Our constitution and by-laws drawn up in 1922 have been repeatedly amended so that one refers to them with difficulty. The original printed copies have been expended and it would seem advisable to have a committee to republish the revised articles. A copy should accompany the letter notifying new members of their election.

A committee composed of one or more members on each hospital staff to report interesting and instructive cases was appointed and I believe should be a valuable asset. Their work should be encouraged.

In 1927, your society adopted a resolution offering a prize for the best essay on a subject in the field of clinical surgery, students at the University of Minnesota working for the degree of Doctor of Medicine, or any interne in a Minneapolis hospital being eligible.

In 1929, one essay was offered and the prize was awarded to Doctor M. E. Knapp on "Afferent Nerve Supply of Blood Vessels." This, the second year of the prize essay contest, six essays have been submitted. Members of the Council who have had the opportunity to read these essays must all agree that they are of high calibre indeed, displaying a tremendous amount of effort in reviewing the literature and hospital records. From these six essays, two have been selected as winners, but the other four are of such excellent quality that it has not been an easy matter to pick the winners. I believe that all of the contestants who have not been fortunate enough to receive a prize award should be sent a letter by the secretary commending them upon the excellence of their work and notifying them that their paper has earned honorable mention. I believe that this would be a stimulus for the presentation of similar papers next year.

I have personally been so well pleased with the result of our prize essay contest this year that I believe in fostering this effort alone our Society justifies its existence.

I would also recommend that, hereafter, all essays be submitted with the understanding that if they are particularly worthy they may be published at the discretion of the Council even though they do not happen to win a prize.

This point brings up the matter of publication of the society's proceedings. Unfortunately all of the membership was not present at the discussion of this matter following the April meeting and as a result I am referring to the matter again. There is no question but what the standard of our scientific papers and the discussion of these papers will be of a higher standard when it is known that they are to be published. The published transactions of the New York and Philadelphia Societies furnish some of the very best material published in the surgical journals. All of us pick up the *Annals of Surgery* and turn to the transactions because we have a feeling that we will find something good. I believe that this society has membership with adequate material and sufficient brilliancy to render the same service through MINNESOTA MEDICINE.

One of the most important tasks confronting our officers is the arrangement of programs. Well do we know that attendance will be largely based upon the quality of the program at a given meeting, and how often have we seen nearly a full attendance when the speaker is a guest from another city, although his presentation may show no greater brilliancy than that displayed by some of our own members. This fact alone should be adequate reason, however, to invite prominent outsiders to make special trips to Minneapolis and to be on the alert to obtain their services when they may be passing through our city.

Since our first meeting in March, 1922, fifty-six prepared papers have been given, or an average of one per meeting. Of these, eighteen, or one-third, have been presented by invited guests. During the same interval, about the same number of members have reported cases of interest. Personally, the writer believes that many surgical truths are best illustrated by the presentation of a well prepared case report. The fact that case reports predominate would support this conclusion.

During the past few weeks I have talked to a number of members relative to the future policy of the society in regard to programs and, judging from suggestions made, combined with the fact that the American College of Surgeons, the Inter-State Post-Graduate Medical Association, the State Medical and others have considered two subjects of prime importance, namely traumatic surgery and cancer, I believe that it might be well for us to consider a whole series of papers in the nature of a symposium on either subject.

The great divergence of opinion as to the rating of permanent disability in industrial cases often makes us the laughing stock of those familiar with the transactions of the Industrial Commission. I believe it is entirely possible that, through the agency of the members of the Surgical Society and those practicing orthopedic surgery and especially those who major in traumatic surgery, some scale could be arranged whereby this discrepancy would no longer exist. At present the law states exactly what the disability is for certain amputations. They might readily specify what the disability would be for the loss of varying degrees of function of the elbow and especially when the elbow is ankylosed in a favorable or an unfavorable position. Some sort of a standardization ought to be possible.

The fact that it is estimated that 300,000 persons in the United States have cancer at the present time and that theoretically early cancer is curable, places the cancer problem foremost among surgical topics. The early diagnosis and standardized treatment of cancer in its various locations may very readily constitute another symposium of surgical essays.

In closing, it may not be amiss to call attention to the fact that we are approaching our tenth anniversary. I think that even at this time we might begin to make

plans for some very special events to celebrate. For instance, one or two special meetings with extraordinary speakers or clinics. You will all remember that years ago Minneapolis had a clinic week at which time all of the doctors of the state were invited to attend the scientific programs and clinics. For some reason or other this clinic week was discontinued. I feel that our society might invite all of the doctors throughout the state to come to Minneapolis for a two-day surgical program put on entirely by our Surgical Society in which papers could be rendered by its members, together with operative clinics. As quoted in our constitution, the purpose of our society is both scientific and social. I believe that a clinic week would fulfill both of these purposes and would reflect much credit upon our society, and let the rest of the state know the excellence of the surgical work that is being done in Minneapolis.

DR. KENNETH BULKLEY reported the following two cases of malignancy of the large bowel in young people.

I would like to report briefly the two following rather similar cases which I feel sure would be of interest. Both of the patients are still in the hospital. Both are cases of malignancy of the large gut in relatively young people.

The first case is that of a boy twenty-four years of age with indefinite abdominal symptoms of which the most predominant was gas. There has been practically no pain, no loss of weight, no true obstructive symptoms. Except for *x*-ray findings his physical examination was negative. A barium enema could not be forced beyond the hepatic flexure. Barium by mouth gave no positive findings other than excessive peristalsis in the ascending colon. Stool examination was negative. At operation an annular carcinoma of the hepatic flexure was found and resected. No metastases anywhere were evident. A typical Mikulicz operation was done and a few days ago I closed his fecal fistula.

The second case is that of a boy of twenty-nine upon whom I operated this evening. This boy three years ago had had a clean appendectomy. Ever since then he has had much abdominal gas, both stomach and intestinal. He has lost no weight; he has had no pain referable to his abdomen. This morning he vomited his breakfast and had abdominal cramps. We started an *x*-ray study on this boy but due to increased distention and persistent vomiting it was not carried to a completion and it seemed wiser to operate on him without further investigation, the operation being done under the diagnosis of intestinal obstruction probably due to bands. Inexcusably, no rectal examination was done and it is largely to point out this error that I report this case. The diagnosis seemed so clear as to the cause of obstruction that the rectal examination was omitted. At operation, however, this boy was found to have a large carcinoma of his rectum fixed to surrounding structures and lying immediately above the levator ani muscle. Again no metastases could be found. The mass had ulcerated through and perforated on its anterior surface with a resulting accumulation of foul smelling fluid in the true pelvis. There were a few adhesions from his old operation but these were not responsible for his obstruction. The lower abdomen was drained and through a left rectus incision a sigmoidostomy was done.

These cases seemed of interest both from a viewpoint of diagnosis and from a viewpoint of rarity. In the first case the differential diagnosis lay between a carcinoma of the hepatic flexure or a tuberculosis of the cecum and ascending colon. In the second case the diagnosis of the cause of the obstruction was wrong. It should have been made without any difficulty had a rectal examination been done.

DR. S. R. MAXEINER presented the following case of cleft palate:

Miss K. F. is a sixteen-year old student.

Family history is entirely negative, no history of tuberculosis, cancer or congenital deformity being obtained.

Past History: Patient has never been seriously ill and has never had any severe accidents.

Present Complaint. Patient was born with a cleft palate involving the posterior four-fifths which was operated upon twice when the patient was two years of age, with almost complete failure. Patient came to us with a large rounded hole in the roof of the mouth, approximately 2 cm. wide and 3.5 cm. in length. Examination was entirely negative, patient being otherwise well developed and physically and mentally normal, except for very greatly enlarged, cryptic tonsils.

Operative Procedures: On November 4, 1929, tonsillectomy was performed and the patient sent home with instructions to report six months later for operation upon her palate.

Stage 1. On April 15, 1930, under local anesthesia, the mucoperiosteum was separated on both sides of the cleft, extending outward to the teeth and running forward to the alveolar arch. This completely loosened the entire palate and the edges of the cleft could be readily approximated without tension. The flaps were penetrated on both sides at the teeth and a packing of iodoform gauze gently placed underneath the flaps. No attempt was made to suture the cleft.

Stage 2. On April 22, 1930, under local anesthesia the flaps were again lifted and the edges pared and approximated without tension with dermal sutures. One mattress dermal tension suture tied over buttons was also used to prevent any traction upon the line of suture. This stage of the operation proceeded with so little effect upon the patient that we determined to attempt to lengthen the posterior edge of the palate, which was altogether too short and was the only part that had been successful at the time of the original operation. After the technic of Brophy, the posterior edge of the palate was freshened. Both pillars on both sides were cut three-fourths of the distance through the palatopharyngeal muscles and the freed upper edges of these flaps were brought together as recommended by Brophy, so that the palate was lengthened three-

quarters of an inch. A second tension suture was introduced and anchored over buttons.

This patient seems of special interest, inasmuch as she has had two previous operations in infancy with almost complete failure. The present operation has been followed by primary healing throughout. The opening in the palate has been completely closed and the palate has been lengthened about three-fourths of an inch. The sutures, which are still in place, will be removed tomorrow, the eleventh day. I believe that we must attribute a large part of this success to the use of the delayed flaps or the two-stage operation, as recommended by New.

Following the scientific meeting Dr. A. T. Mann, the new president, was escorted to the chair and conducted a brief business meeting.

The meeting adjourned until October, 1930.

H. O. McPheeters, M.D.
Secretary

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
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THOMAS A. PEPPARD,
MEDICAL ARTS BLDG., MINNEAPOLIS

THE RELIABILITY OF GUINEA PIG INOCULATIONS IN THE DIAGNOSIS OF TUBERCULOSIS: Abstract of a paper by T. B. Magath and W. H. Feldman, read before the Trudeau Medical Society, Rochester, Minnesota, March 29, 1930; to be published in American Review of Tuberculosis. In order to evaluate the reliability of inoculation of guinea pigs in the determination of obscure tuberculous infections, a study was undertaken to ascertain, first, if the tissues of guinea pigs which failed to reveal at necropsy gross tuberculous lesions contained histopathologic evidence of tuberculosis, and second, what should be considered of significance in the histologic examination of tissues of guinea pigs in minimizing possible diagnostic errors.

Use was made of material consisting of catheterized urine from the ureters and bladder, tissues from bones and joints, thoracic fluids, and miscellaneous tissues obtained from the Section on Clinical Pathology of the Mayo Clinic. The material which was negative for *mycobacterium tuberculosis*, by the usual microscopic examination, represented 158 consecutive cases.

Two guinea pigs were given injections with portions of each specimen, one subcutaneously and one intraperitoneally, and those living at the expiration of eight weeks were killed and necropsy was performed. The presence or absence of a tuberculous infection was determined as a routine by the gross appearance of the viscera. By this procedure, twenty-one of the cases were eventually considered tuberculous. The liver and spleen of 201 of the guinea pigs which died or were killed subsequent to inoculation, and which were considered nontuberculous at the time of necropsy, were examined by appropriate histologic methods for possible lesions of tuberculosis.

Although occasionally tissue was found which possessed alterations simulating in some degree the morphologic reaction to the organism of tuberculosis, the failure to demonstrate the causative organism was considered decisive in designating each of these lesions as nontuberculous.

In a study of the reactions of tissue subsequent to a definitely tuberculous infection it was found that undue significance should not be placed on the cellular aspects of the lesion. The presence of giant cells of Langhans type may be particularly misleading. In guinea pigs affected with tuberculosis, and on which necropsy is done eight weeks subsequent to exposure, giant cells are not an essential part of the lesions and usually are absent. By appropriate staining methods, acid-fast bacilli can be found among the cells of the cellular detritus in practically every instance in which the lesions are those of tuberculosis, and failure to observe acid-fast organisms in lesions which are typically not those of tuberculosis is presumptive evidence that the condition is nontuberculous.

The data obtained in this study have established the reliability of inoculation of guinea pigs in the diagnosis of tuberculosis. Animals which live eight weeks subsequent to injection and which fail to reveal gross lesions of tuberculosis at necropsy, in all probability do not possess a tuberculous infection, and the routine histologic examination of such tissues is not necessary. When a histologic study is done, the presence or absence of acid-fast bacilli rather than the specific nature of the cellular reaction constitute the most dependable criteria in reaching a decision.

William H. Feldman, V.M.D., M.S.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
MEDICAL ARTS BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

EPITUBERCULOSIS: Phillip E. Rothman, M.D., Los Angeles (Arch. of Ped., March, 1930, Vol. XLVII, No. 3). Epituberculosis consists of a large area of pulmonary consolidation associated with enlarged mediastinal tuberculous glands. The consolidation may

persist for many months, but ultimately resolves with little or no permanent lung damage. The onset is insidious and none of the case reports include early signs or symptoms of any constancy. The child's general condition is fairly good and there is usually no dyspnea, polypnea, or diminution in the degree of expansion of the affected side.

The physical signs are those of consolidation with dullness, slightly distant tubular breathing, but with a great paucity of râles or even none at all. An ordinary pneumonic process is suspected. The tuberculin test, however, is invariably positive and the *x*-ray shows a wide mediastinal shadow in addition to a homeogeneously dense consolidation.

The insidious onset, positive tuberculin test and long duration speak for epituberculosis. The absence of tubercle bacilli in the sputum is a very helpful point in differentiating this condition from caseous pneumonia.

Some have maintained that it represents an allergic response in patients previously infected with tuberculosis; whereas, others feel that it is an atelectatic or collapsed portion of lung resulting from regional swelling of bronchial lymph-nodes with lymphatic stasis or actual pressure on the bronchi. It is generally believed that the process is simply an inflammatory reaction about a tuberculous focus in either the mediastinal glands or lung tissue, and that it contains no tubercle bacilli. In this respect it is non-specific, but it is specific in the sense that it is always secondary to or associated with a tuberculous infection.

R. N. Andrews, M.D.

TUBERCULOSIS IN INFANCY AND CHILDHOOD: Nursemaids as a Source of Infection—Henry Dietrich, M.D., Los Angeles (Arch. of Ped., March, 1930, Vol. XLVII, No. 3). It is only during the past few decades that we have begun to realize the frequency and gravity of tuberculosis infections in the young child. Tuberculosis is a disease of childhood. It generally begins in childhood and therefore our preventive measures must be aimed particularly at this period of life. The tubercle bacillus, once implanted in the body of the child, finds a most fertile soil for its growth and, as we know, even if apparently overpowered by the body forces, may at any time in the future light up and blight or destroy a useful life.

The following four facts about tuberculosis are now well established: (1) Tuberculosis is an acquired and therefore preventable disease. (2) The tuberculous patient is generally the source of infection. (3) The great majority of infections in man are air-borne. (4) The younger the individual the greater the susceptibility and the more dangerous the disease.

It may require only a few hours a day of association with an open tuberculosis to infect and perhaps destroy the young infant or child. A tuberculous nursemaid or governess not only is a menace to her own household but frequently also comes in close contact with many of the children in the neighborhood.

Today we demand a tuberculin test of our dairy cattle. We ask for a health examination of the employees of our certified dairies and of many employees in other industries. Boiling the milk will destroy the tubercle bacillus. Nothing except removal of the person with a tuberculous focus will protect the child against infection. We must demand a health examination of all persons making it their business to care for or help care for infants and children.

R. N. Andrews, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:

VIRGIL J. SCHWARTZ,
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ARTHUR C. DEAN
HOT SPRINGS, SOUTH DAKOTA

RELIEF OF NASAL OBSTRUCTION IN CHILDREN DUE TO DEVIATION OF THE SEPTUM: W. W. Carter, M.D., New York City (Ann. of Otol., Rhin. and Laryng., Vol. 39, No. 1, pp. 199, Mar. 1930). The author mentions the difference of opinion among our ablest rhinologists as to the method to be employed for relief of nasal obstruction, and the extent of operative interference permissible at an age before nasal development is complete.

The author feels that the extensive removal of the septum in the very young is not the procedure of choice. He believes that the septum is a very prominent factor in the development of the flattened infant nose into the prominent adult nose. For that reason he does not accept the complete submucous resection of the septum as the operation of choice.

He cites the dynamics of nasal development and shows that the septum is by far the most important factor. For that reason the septum must be preserved to the greatest extent consistent with relief of obstruction.

His method follows: Ether anesthesia, the usual vertical submucous resection incision is made and the mucosa elevated on that side. Then he inserts the submucous knife into the sac and makes two parallel incisions from behind forward on either side of the apex of the deflection. These incisions extend only through the cartilage. Next this narrow strip of cartilage is removed. An incision is next made through the upper segment parallel with the dorsum of the nose and the entire length of the deflection. A corresponding incision is made below and parallel with the floor of the nose. These two incisions destroy the resiliency of the cartilage. Next the septum is lined up in its normal vertical position. Then gold wire splints are introduced into each nostril and moulded to fit the case. These splints should remain in the nose for 10 days, and the nose cleansed daily with an alkaline solution.

Immobilization of the nose with a lined copper splint is essential.

Arthur C. Dean, M.D., F.A.C.S.

MASTOIDITIS WITH GASTROINTESTINAL DISTURBANCES IN INFANTS: John W. Carmack, M.D., Indianapolis (Ann. of Otol., Rhinol. and Laryngol., Vol. 39, No. 1, p. 75, March, 1930). The author says that since 1921 the relation between gastro-enteritis and mastoiditis in infants has been recognized by Renaud, Byfield and Dean. There has, however, been some conflicting opinions as to the advisability of mastoid drainage externally, as well as the proper time for interference. He divides these cases into two groups: First, in which there is an acute respiratory infection, including the middle ear and mastoid, together with a violent enteritis, dehydration and toxemia; second, in which there is mastoiditis, but it is doubtful whether the gastrointestinal disturbance is due to actual infection of the bowel or to a toxic disturbance. This latter group has much less violent symptomatology of the gastrointestinal tract.

In twenty-eight infants, twenty-one were operated on for both mastoids at the same time; of the seven remaining it was necessary to operate on the other side later in four. The most unsatisfactory results were obtained in the patients operated on during the active stage of a dehydrating diarrhea and high temperature. There is much to be desired in the standardization of our ideas as to the time for operation and the preoperative and postoperative treatment. The diagnosis and proper course to pursue can only be determined by the closest coöperation between the otolaryngologist, the pediatrician and the roentgenologist.

The appearance of the drum membrane is not always a safe criterion of the pathology inside. Few, if any, infants with gastrointestinal disturbances have normal drum membranes. External mastoid signs have been notably absent. *X*-ray plates are valuable but very difficult to interpret. It seems that the normal mastoid space is larger than formerly believed in the first and second years of life. Cell formation has been seen frequently as early as one year of age.

The most satisfactory time for operation is after the acute storm subsides. Preoperative treatment consists in restoring the body fluids, and blood transfusion where hemoglobin is under 70 and red blood cells under 4,000,000.

All operations are done under novocaine and codeine. The wound is left open and heals by granulation. Postoperative care is supportive and stimulating. Fluid and food are pushed. Repeated transfusions if necessary.

CONCLUSIONS

1. Mastoiditis may occur coincidental with an acute respiratory and gastrointestinal infection and may become an important factor in the outcome of the case; in others, the mastoid may become involved and remain as a focus of infection producing gastrointestinal symptoms of a toxic nature or subsequent intestinal infection.

2. Surgical intervention cannot be decided upon intelligently without close coöperation between the pediatrician, the otolaryngologist and the roentgenologist, but no mastoid should be opened without clinical evidence of disease in the mastoid space.

3. Adequate preoperative and postoperative treatment is of vital importance.

4. All infants with marked or continued gastrointestinal disturbance should have careful ear examinations, and if pathology is found, early and free drum incision should be made. If the mastoid is involved and satisfactory improvement is not had by ear drainage a mastoid operation is indicated.

5. Operation, except in the occasional case, should not be attempted during the violent gastrointestinal crisis.

ARTHUR C. DEAN, M.D., F.A.C.S.

ROENTGENOLOGY

SUPERVISORS

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MAYO CLINIC, ROCHESTER

ROENTGENOGRAPHY OF THE KIDNEYS AND URINARY TRACT BY MEANS OF INTRAVENOUS INJECTION OF A NEW CONTRAST MEDIUM, UROSELECTAN: M. Swick (Klin. Wchnschr., November 5, 1929, p. 2087). While investigating the excretion of Selectan-Neutral, which had been used therapeutically in the treatment of different coccus infections, it was discovered that excretion was more marked through the kidneys than through the bile. The first results by intravenous injection in animals were only sufficiently satisfactory to indicate the possibility of the method if the affinity for the kidney and the solubility of the substance could be improved. Oral administration in man was not successful. Continued investigation with the coöperation of the chemical institute finally evolved a substance which answered the requirements of safety, free solubility and marked excretion by the kidneys. This has been named Uroselectan. The iodine content of this drug is 42 per cent. It is well tolerated intravenously by mice and squirrels and when injected intravenously in man in proportionately much smaller amounts, yields very satisfactory pyelograms. The density of the picture depends directly on the condition of the kidney, as does also the time at which the best picture is obtained. The latter varies from one to two hours in the presence of good kidney function to 24 or even 32 hours in poor function. When function is very poor, no shadow is obtained. Whether normally or slowly excreted, the drug is not demonstrable in the blood after fifteen minutes. What becomes of the substance when not excreted has not been determined. In the clinical tests there were no deleterious effects of consequence. Death nineteen hours after injection in a girl of ten was shown to be due to the severe and advanced nature of the pathological conditions. The conclusion is

that Uroselectan is remarkably well tolerated in all surgical kidney diseases.

After intravenous administration, performance of which is very simple, films are taken at intervals, depending upon the rapidity of excretion. Fluroscopy was also employed.

Reproductions of eight typical urograms are included.

EDWARD SCHONS.

CLINICAL TRIAL OF UROSELECTAN: A von Lichtenberg and M. Swick (Klin. Wchnschr., November 5, 1929, p. 2089). This new substance promises extensive clinical applicability of intravenous urography. The method offers in cases of sufficient kidney function satisfactory urography; in all cases a roentgenological function test, as well as a new chemical function test.

All cases examined with Uroselectan were controlled by direct pyelography and the results compared. Of 84 cases examined, the results were checked operatively in 35 cases and by autopsy in 1 case. The results with Uroselectan were technically successful and the pictures serviceable for diagnosis. No shadow indicated always either absence of the kidney or marked impairment of kidney function. The shadow was thus absent in advanced kidney tumor, pyonephrosis, severely infected obstructed kidney; also in marked cardiac insufficiency. In all cases of marked or total obstruction if accompanied by infection the shadow was absent. In cases of hydronephrosis, ureteral stone and high grade renal disease due to stone, excellent pyelograms were obtained. A very interesting case of closed tuberculous pyonephrosis showed cavities in the upper half of the kidney.

The method was used in nearly all forms of primary and secondary surgical kidney pathology. In prostatic hypertrophy the dilatation of the pelves and ureters was well shown.

Prof. von Lichtenberg is very enthusiastic about the possibility of studying the function of the ureters.

In 61 out of 84 cases examined, fully sufficient information for the preliminary handling of the case was obtained, cystoscopy, ureteral catheterization and pyelography being necessary in the remainder. In 75 cases information as to function was sufficient to determine the operative indications. In all cases was the examination of the case expedited and simplified and in 70 per cent could more radical examination be avoided.

Indications for intravenous pyelography are given as follows: (1) Cases where direct cystoscopy, ureteral catheterization and pyelography cannot be done because of anatomical, pathological or technical reasons; (2) cases of obstruction where direct injection can be done only to the point of obstruction; (3) where the ordinary method is risky.

No contraindications are at present mentioned, but it is stated that so far the ureters are often better shown by the old method.

EDWARD SCHONS.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

TREATMENT OF SKIN DISEASES—IN DETAIL. Noxon Toomey, M.D., F.A.C.P. Late instructor in Dermatology, St. Louis University, Major and Surgeon, 138th Infantry, Missouri National Guard, Dermatologist to the Terminal Railroad, sometime editor of the Urologic and Cutaneous Review. 512 pages. Cloth, $7.50. St. Louis: The Lister Medical Press, 1930.

BULLETIN OF THE NATIONAL RESEARCH COUNCIL, No. 73. A survey of the Law Concerning Dead Human Bodies. George H. Weinmann. Issued under the auspices of the Committee on Medicolegal Problems, National Research Council. 199 pages. Paper, $2.00. Washington, D. C.: National Research Council, 1929.

UTERINE TUMORS. Charles C. Norris, M.D., Professor of Gynecology and Obstetrics and Director of the Department, University of Pennsylvania; Gynecologist and Obstetrician, Hospital of the University of Pennsylvania, Henry Phipps Institute of the University of Pennsylvania. 251 pages. Illus. Price $3.00. New York: Harper & Brothers, 1930.

LECTURES ON COLONIC THERAPY. O. Boto Schellberg. 55 pages. Illus. Price $2.00. New York: The Oboschell Corporation, 1930.

DIABETES—Directions for Treatment by Insulin and Diet. Benjamin F. Smith, M.D. Physician and lecturer to St. Joseph's Infirmary, Hermann Hospital, and Jefferson Davis Hospital, Houston, Texas. 223 pages. Price, cloth $2.00. New York: D. Appleton & Company.

TUBERCULOSIS AMONG CHILDREN—J. Arthur Myers, Ph.D., M.D., F.A.C.P., Chief of Medical Staff Lymanhurst School for Tuberculous Children, Associate Professor of Preventive Medicine, University of Minnesota. Chapters by C. A. Stewart, M.D., Ph.D., and Paul W. Giessler, M.D., of the University of Minnesota. 208 pages. Illus. Cloth, $3.50. Springfield, Illinois: Chas. C. Thomas, 1930.

INJECTION TREATMENT OF INTERNAL HEMORRHOIDS—Marrion C. Pruitt. 137 pages. Illustrated. Price $3.00. The C. V. Mosby Co., St. Louis, 1929.

In this book there is a general discussion of hemorrhoids, including anatomy, etiology, prophylaxis, history, etc. The author expresses his own opinion and in-

cludes that of other authorities on the subject. A classification of hemorrhoids is given, and symptoms and other conditions of the anus are considered.

The second half of the book is devoted to discussion of the injection treatment, giving indications, contra-indications and various solutions used. The author's idea of treatment is clearly given and necessary illustrations are included; also a series of case reports.

The book lives up to its title and covers the subject in such a manner so as to make it more practical than theoretical.

ARTHUR E. STOECKMANN, M.D.

PHYSIOLOGY FOR NURSES: W. G. Christian and Charles C. Haskell. Second Edition. $2.00. St. Louis: C. V. Mosby Co., 1929.

A rather complete volume that may be used if a nurse is familiar with anatomy.

It is well illustrated and particular attention has been paid to the chemical aspect. The volume is too brief, however, and not enough attention has been given food digestion and nervous system.

This volume could be used to advantage for review.

INEZ PEYTON.

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WANTED—Recent graduate, single, one who is interested in pediatrics and medicine. Salary $200.00. Address D-78, care MINNESOTA MEDICINE.

FOR SALE—One Kelley-Koett portable *x*-ray unit, complete, $450.00. Like new. Used slightly. Address 802 Donaldson Building, Minneapolis, Tel. Main 2904.

FOR SALE—Alpine mercury quartz lamp. Has burned only a few hours. Call Geneva 7959. 1953 Medical Arts Building, Minneapolis.

FOR SALE—New Hanovia lamp, large size, $250 cash. Address Dr. J. R. Sturre, 3402 University Ave. S. E., Minneapolis.

WANTED—Experienced technician desires temporary or part-time work with group of physicians or in hospital laboratory. Can furnish best of references. Address D-77, care MINNESOTA MEDICINE.

OFFICES FOR RENT—Excellent location for physician and dentist. Modern fireproof building. Rent very reasonable. W. C. Kregel Drugs, 2180 Marshall Avenue, Saint Paul.

WANTED—Medical man to share office, Lowry Medical Arts Building, Saint Paul. Office hours to suit. Well equipped. Telephone, Humboldt 4645.

POSITION WANTED in physician's office in or near Twin Cities by young woman physiotherapy technician. Can run urinalyses, make blood counts, also some *x*-ray. Eight years experience. Address D-65 care MINNESOTA MEDICINE.

WANTED—Position by experienced *x*-ray technician and physio-therapist, graduate of Swedish Hospital, Minneapolis. Can do general office work. Address D-75, care MINNESOTA MEDICINE.

WANTED—Physician for locum tenens, six weeks, starting July 1, Southern Minnesota town, 1,000 population. Address D-68, care MINNESOTA MEDICINE.

FOR SALE—Good general and well established practice with residence, in South Minneapolis. Leaving for West. Address D-79, c/o MINNESOTA MEDICINE.